

A Database Publication

# electron

## user

Vol. 3 No. 10 July 1986 £1

## SNAP DRAGON

*A new way to play  
the classic card game*

**Making long  
listings legible**

**Add WHILE . . . WEND  
to Electron Basic**



Solve the  
R·O·Y·A·L W·E·D·D·I·N·G  
puzzle

**Turbo-Driver  
reviewed**



16K EPROM  
Advanced Disc Toolkit  
containing over 30 commands

# Advanced Computer Products

Advanced Computer Products  
6 Ava House, High Street,  
Chobham, Surrey GU24 8LZ  
(0276) 76545

## ADVANCED DISC TOOLKIT

(01) /M/B/E

£34.50

Any Acorn user including Master, BBC B+, Electron, DFS, 1770 DFS, ADFS, 2nd. & co-processors A.C.P.'s BEST SELLING product containing over 30 commands inc:- powerful memory & disc editor, search memory/disc/basic, catalogue/unplug ROMS, load/run programs below page, automatic menu, file transfer (inc. locked cassette files), ADFS utils etc. etc. ("it's superb" ... Database Pubs. - "excellent value for money" ... Acorn User) (16K EPROM & FULL MANUAL)

## ADVANCED ROM ADAPTOR 2

(03) /M/E+1/

£14.95

An Acorn approved cartridge containing a card with special 'zero' profile sockets that allow you to fit compatible 8K or 16K EPROMS/ROMS. The cartridge is fully enclosed providing complete protection for your ROMS. Simple to use - no switching - complies fully to the Acorn (sideways) Rom Filing System. A.R.A.2 contains 2 sockets.... A single adaptor is also available.... A.R.A.1 (02) /E/ £10.35

## ADVANCED SIDEWAYS RAM

(04) /E+1/

£29.90

A highly versatile but simple to use s/w RAM cartridge that is automatically write protected on loading. Contains 16K RAM but can be switched (externally) to 2 X 8K RAM. Supplied with instructions & full software support (on cassette) to save ROM images to disc/tape, load RAM from file, Advanced Print Buffer & MakeRom a utility to merge several files from disc to be run from the ROM FS. (S/Ware on disc: please add ... £1 5 1/4 DFS .. £2 3 1/2 ADFS)

## ADVANCED ELECTRON DFS

(05) /E/

£24.15

Electron & Plus 3 users ... gain BBC compatibility by adding the Advanced Electron DFS (1770 DFS) this is the same disc filing system supplied with the BBC B+. Now you can produce and access (compatible) BBC disc based software. A.C.P. also supplies 5 1/4" disc drives to add to your Plus 3 (inc. 2nd. drive adaptor). "ACP has produced another superb ROM for the Electron" ... Electron User Feb '86 (supplied on 16K EPROM + DFS MANUAL)

## ADVANCED DISC INVESTIGATOR

(06) /M/B/E/

£28.75

A very powerful Disc utility for standard & non-standard discs. Backup most protected discs, edit any type of non-standard disc, check & repair faulty tracks, create new disc formats, copy 40track discs to 80track discs, verify two non-standard discs. ("ADI features an extremely comprehensive sector editor, and one of the finest I've seen" ... Tublink on Prestel) (supplied on 16K EPROM + manual)

## ADVANCED ROM MANAGER

(07) /M/B/E/

\* £9.99 \*

A friendly utility for ROM & sideways RAM. Examine ROM/RAMs, load files into RAM, move memory to/from Sways ROM/RAM, catalogue/kill ROMS, offer commands to specific ROMS, save ROMs to disc/tape, AUTOROM a file (inc. BASIC) to run from Sways ROM/RAM, execute specific machine code subroutine in a ROM, generate a ROM's checksum & CRC.

\*SPECIAL ANNIVERSARY PRICE .. LIMITED PERIOD\* (supplied on EPROM + manual)

## ADVANCED PLUS 4

(08) /E+1/

£79.98

"DISC DRIVE COMPATIBILITY AT LONG LAST" ... (Electron User June '86) this sums up AP4 & ACP's approach to producing products. AP4 is a fully ACORN compatible disc I/face & will accept any standard drive inc. PSU, runs 1770 DFS (as fitted in the B+ & Master), keeps page & Eee, utils in ROM & provides a spare rom socket. "ACP's Plus 4 comes out on top. I can recommend it to anyone ... " (E.U. June '86)

PLEASE PHONE FOR PACKAGE PRICE ON AP4+D/DRIVE

## ADVANCED PLUS 5

(09) /E+1/ NEARING COMPLETION

A triple interface cartridge providing...  
1) a TUBE i/face allowing a second processor to be connected, increasing BOTH speed & memory (PAGE & 8000 HIMEM & 8000 in all modes)  
2) a 1 MHz BUS for control applications & prommers  
3) the USER PORT for mouse and graphic devices.  
Also contains 2/3 ROM sockets and on board operating software for 2nd processor.

## ADVANCED 1770 DFS

3 versions ADM (11) - ADB (12)

ADE (13)

£34.50

ACP have totally re-written the Acorn 1770 DFS, enhancing existing features & adding new ones. The result is probably the fastest & most powerful disc filing system your computer could have. With the ability to operate in double density occupying both sides of a disc (640K). Automatic file relocation, improved file handling, 62 file catalogue and Sways RAM can be used as a fast RAM DISC.

(16K EPROM + comprehensive manual)

## ADVANCED ELECTRON DFS Eee

(14) /E+ASR/

£19.99

An alternative to our AED(05) for Plus 3 and ASR users. This optional alternative DFS is designed for use in Sideways RAM (ASR) and allows the user to operate a disc filing system & Eee when using the Plus 3 (in ADFS page would normally be & 1D00). The DFS is simply loaded using the software supplied with the ASR from disc. (optional upgrade for existing AED users £9.50 on return of existing AED users £9.50 on return of original EPROM)

(3 1/2" ADFS disc + manual)

## \*OTHER PRODUCTS & SPECIAL OFFERS\*

VIEW cartridge	(101)	/E+1/	£15.00	3 1/2" discs in 1/box	(120)	/M/B/E/	£24.00
Vsheet	(102)	/E+1/	£15.00	5 1/4" discs ds/dd	(121)	/M/B/E/	£12.99
VIEW & VSHEET	(119)	/E+1/	£25.00	5 1/4" discs ss/sd	(122)	/M/B/E/	£ 8.99
LISP cartridge	(103)	/E+1/	£ 9.99	3 1/2" disc drives	(please call for price)		
E/Adv User Guide	(104)	/E/	£ 4.95	5 1/4" disc drives	(please call for price)		
TURTLEgrhpCASS	(105)	/E/	£ 3.99	2nd. Drive Adaptor	(130)	/E+3/	£ 7.95
LOGO cartridge	(106)	/E/	£44.95	3 1/2" library box	(124)		£ 2.95
PASCAL cartridge	(107)	/E/	£44.95	16K EPROMS	(131)		£ 3.75
VIEW pack BBC	(118)	/B/	£49.00	VIEWSTORE	(117)	/M/B/(e)	£57.95

Equipment codes /M/ = Master /B/ = BBC /E/ = Electron /E+1/ = Electron + Plus 1

Please send order to:  
Advanced Computer Products Ltd.  
6 Ava House, High Street,  
CHOBHAM, Surrey, England  
GU24 8LZ. Tel. 0276 76545  
(mail order only)



(in event of any query -  
please include your tel. no.)

NAME .....

ADDRESS .....

POSTCODE .....

TEL. ....

CREDIT CARD No. ....

(CODE) PRODUCT QTY @ TOTAL

I enclose payment for £ .....  
(ref E14)



## News

All that's new in the ever expanding world of the Electron. **5**

## MicroLink News

A monthly update on the increasing potential of Britain's national on-line database. **7**

## Graphics

How to tidy up your MOVEs and DRAWs, and add colour to them while you're at it. **8**

## Discs

How to use the disc system to give you extra star commands. **10**

## Software Surgery

The latest software releases reviewed. Bullseye, Tennis, Ian Botham's Test Match and Jet Set Willy - they're all here. **13**

## Attributes

This colourful two player strategy game will provide hours of fun for the whole family. **17**

## Hardware

Want to supercharge your Electron? The Elk Turbo-Driver from Slogger may give you the speed you've been looking for. **22**

## Extra Commands

This fascinating series comes to an end as we provide your micro with a WHILE ... WEND command. **26**



## Royal Wedding

Whether you're new to sliding block puzzles or not you'll have hours of fun with this program to celebrate the most exciting royal event of the year. **34**



## Snapdragon

Enjoy this two player version of the classic card game. It uses your Electron's graphics capabilities to the full. **29**

## Osword

In the last part of the series we look at the calls that deal with the internal elapsed time clock and the interval timer. **41**

## Beginners

In the battle against the dreaded GOTO, subroutines can be a vital tool. This is how to use them. **44**

## Micro Messages

The pages you write yourselves. A selection from the many interesting letters you've been sending us over the last few weeks. **47**

## Formatter

Make your listings easier to read with this utility to split multi-statement lines. **55**



## Merlin

More hints and tips for adventurers from our resident wizard. **56**

## Education

We take a look at a variety of software including arcade games and adventures and discuss its role in a teaching environment. **59**

## Bargains galore!

Don't miss our special offers on Pages 50 to 53.

Managing Editor  
**Derek Meakin**  
Features Editor  
**Mike Bibby**  
Deputy Features Editor  
**Roland Waddilove**  
Production Editor  
**Peter Glover**  
Art Editor  
**Heather Sheldrick**  
Reviews Editor  
**Chris Payne**  
Advertisement Manager  
**John Riding**  
Advertising Sales  
**John Snowden**  
Editor in Chief,  
Database Publications  
**Peter Brameld**

**Published by Database Publications Ltd**  
Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.  
Telephone: 061-456 8835 (Editorial) 061-456 8383 (Administration) 061-456 8500 (Advertising)  
Subscriptions: 061-480 0171. Telecom Gold Mailbox: 72:MAG001. Prestel: 614568383.  
Telex: 265871 MONREF G. Quoting Ref. 72:MAG001.

**ABC** 24,788 July-December 1985

**News trade distribution:**  
Europress Sales and Distribution Limited,  
Unit 1, Burgess Road, Ivyhouse Lane,  
Hastings, East Sussex TN35 4NR. Tel:  
0424 430422.

*Electron User is an independent publication. Acorn Computers Ltd, manufacturers of the Electron, are not responsible for any of the articles in this issue or for any of the opinions expressed.*

Electron User welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication will be on an all-rights basis.

**Subscription rates for 12 issues, post free:**  
£12 UK & Eire (Sterling only)  
£20 Europe  
£35 Overseas

© 1986 Database Publications Ltd. No material may be reproduced in whole or in part without written permission. While every care is taken, the publishers cannot be held legally responsible for any errors in articles or listings.



**WORN OUT** with  
wordprocessing?  
**DEPRESSED** with  
databases?  
**OPPRESSED** with  
machine code?

**Then you need...**

(It's the perfect antidote to  
microcomputer malaise!)



#### Volume 1 contains:

##### **Jam Butty**

Machine code simulation of high drama on a building site

##### **Golf**

Play a round by yourself, or play against your pals.

##### **Haunted House**

Fight against all the odds to get out alive.

##### **Space Hike**

Another classic. Help the spacemen avoid marauding monsters.

##### **Park's Peril**

Help Parky through an invisible maze, racing against time.

##### **Rally Driver**

All the thrills of high-speed driving, with none of the risks.

##### **Alphaswap**

Your letters are in a twist. Can you put them in order?

##### **Knockout**

Fast and furious action as you batter down a brick wall.

##### **Money Maze**

Avoid ghosts and collect coins in an all-action arcade classic.

##### **Lunar Lander**

The traditional computer game specially written for the Electron.

#### Volume 2 contains:

##### **Atom Smash**

Machine code thrills as you help to save the world from destruction.

##### **Bunny Blitz**

Go egg collecting, but keep away from the proliferating rabbits.

##### **Castles of Sand**

Build castles – but beware the rising tide and hungry sandworms.

##### **Reaction Timer**

Test your reactions with this traffic lights simulation.

##### **Solitaire**

The Electron version of the age-old game of logic and patience.

##### **Jumper**

Jump for your life in this exciting arcade action game.

##### **Break free**

Test your wits and reflexes in this popular classic ball game.

##### **Code Breaker**

Crack the code in a colourful if frustrating brainteaser.

##### **Parachute**

Save the plunging sky divers from a watery end.

##### **Star Fighter**

Attack the bandit ships in this fast-moving 3D punch-up.

**ONLY  
£5.95  
each**

**TO ORDER, PLEASE USE THE FORM ON PAGE 53**



# electron user NEWS

## Electron sales top at big Show

**WITHIN an hour of the doors being opened for the spring Electron & BBC Micro User Show, the scene was set to break not one but four records – thanks in no small part to the Electron.**

At that time the turnstiles were temporarily closed because of the volume of people flooding into the New Horticultural Hall.

It was a situation repeated on several occasions during the three day event which attracted more than 16,000 visitors, an all-time high.

The first day alone saw more than 5,000 enthusiasts converge on the exhibition – the largest number ever during a weekday.

Yet another record fell when it was assessed that more than £1,200,000 worth of business had been achieved at the show, beating the previous best by £200,000.

Nor were the smiles confined to the faces of exhibitors. A survey of stands showed more than 500 special offers on display – close to 100 in excess of the former record.

"It was just fantas-

tic", reported John Huddleston of Advanced Computer Products, a leading supplier to the Electron market.

"We took more on the first morning than we did for any of the previous shows. In fact we sold out of our new AP4 interface for the Electron by noon that day.

"The only trouble is having exhibited at the

last few shows, I'm now running out of superlatives to describe them".

He went on to point out that interest in the Electron demonstrated at the show now far outweighed that in the BBC Micro.

"Even though obviously a lot of people had come to see the new Master 128, even that was pushed into second place in the popularity



*Electron fans packed the Show*

stakes by the Electron.

"In fact although we sell add ons for all three machines, Electron sales surpassed those of the other two quite easily".

A similar story was to be heard around the show with exhibitors revealing that products

for the Electron were outselling those for the BBC Micro by three to one.

Companies in the Electron market are really reaping the benefits at the moment", Bob Simpson of Micro Power told *Electron User*.

## MORE IN SCHOOLS

**A SURVEY has shown that Electrons are becoming increasingly popular in classrooms across the country.**

Schools short of funds are eagerly seizing on the cut-price machine to provide support for their complement of BBC Micros.

What is attracting the teachers is that by combining the Electron with the new AP4 disc interface they have a package with many of the BBC Micro and Master

features. "And what is most important is that you get all this for well under £200", explained Ken Gill, a Birmingham schoolmaster.

The AP4 interface from Advanced Computer Products is fully Acorn compatible, running 1770 DFS at &E00.

As a result, it enables more tape software to be run from disc, does not use up any of the RAM inside the machine, and allows the user to access

compatible BBC disc-based software.

Officially launched at the Electron & BBC Micro User Show, there was a heavy demand there for the innovation – particularly from teachers.

"They were beating their way over to our stand in droves", says John Huddleston of ACP, "for they see that this combined with the Electron provides the first true cheap alternative to the BBC Micro".

## Budget boom

THE fight for the rapidly growing budget-priced games software market has intensified – with Electron users the first to benefit.

Artic has now spearheaded a drive in the budget market with its first two releases for the Electron.

Charles Cecil, a director of Artic, said: "We have had good sales even before our publicity drive. If they continue we will respond with two new titles every four to six weeks".

The two games for the Electron – Woks and The Great Wall – cost £1.99 each.



## Enthar Seven coming

A MODE 6 version of Robico's disc-only adventure Enthar Seven is soon to be launched for the Electron.

The game currently only runs on a disc-based BBC B, B+ or Master. It features 450 locations, more than 130k of text and an advanced command line interpreter to bring the science fiction package to life.

However Robico has now used the Advanced Computer Products 1770 DFS, which is Acorn DFS compatible and leaves enough of the Electron's memory left for the adventure.

The Electron version will be identical to the BBC version with the exceptions that there will be no colour option for text and the @BUFFSAVE and @BUFFLOAD commands which save and load a game to and from memory will be omitted.

Enthar Seven will cost £17.95 on twin disc 40 track and £16.95 on single disc 80 track.

Meanwhile Robico has completed the storyline for the third and final part of the Rick Hanson trilogy.

# ACORN MAY RE-RELEASE DORMANT SOFTWARE

IN the wake of the continuing boom in Electron software sales, Acorn is currently considering re-releasing dormant titles.

Discussions are being held with Greyhound Distribution, the company which recently acquired the rights to all the Electron titles produced by Acornsoft.

At that time up to 100 programs were involved, among them the best seller Elite, a number of utilities including View and Viewsheet, a host of educational software and languages such as Pascal and Logo.

In all around 100,000 units were bought by Greyhound,



**TROPHIES and a weekend in London were the prizes for the five-strong Micro Power telesales team from Leeds for beating their targets for Electron software. But it wasn't all fun. They had to roll up their sleeves on the company's stand at the Electron and BBC Micro User Show while they were down there.**

but such has been the demand since that time that many of the best known programs will soon be out of stock.

"That is why we are currently discussing with Acorn the question of re-issuing titles", Bob Simpson of Greyhound

told *Electron User*.

"In effect it will mean putting back into production a number of programs".

Greyhound's parent company - Micro Power of Leeds - has been responsible for marketing the Acornsoft product primarily via mail order.

"And it has gone extremely well - even better than we hoped", says Bob Simpson. "But the same could be said for most companies offering Electron software I imagine. For the people who stayed in this market are reaping the benefits."

"It proves our confidence in this market was well-founded."



## Electron boom in Indonesia

THE Electron is in the forefront of a home computer boom in far-away Indonesia.

But there's a danger that the machine's successful marketing drive could run out of steam due to a shortage of peripherals and spare parts.

Regular reader Wibowo Soelistyo, who runs a computer shop in Semarang, wrote to ask for *Electron User's* help in ensuring that supplies don't dry up completely.

He sent a sheaf of photographs to show how popular the Electron stand was at a recent computer exhibition in Indonesia.

Now he wants UK suppliers of Electron products to help him service the growing

number of Electron owners in his country.

"As an Electron dealer I have sold many of these machines", Wibowo wrote. "We also have a workshop and technicians to service Electrons, but we find great difficulty in getting spare parts such as the RF modulator, keyboard cable connector and others."

"I would be grateful to hear of anyone in the UK who could supply us with spare parts, software and other products for Electron expansions".

Wibowo Soelistyo can be contacted at Gemah Permata Computer Shop, Pusat Per-tokoan, Lima Blok H No. 5, Semarang 50241, Indonesia.

## More speed, memory

A NEW 6502 second processor from Permanent Memory Systems, the PMS-E2P, is claimed to make the Electron as powerful as the BBC Micro.

It plugs into the Plus 1 to give more usable RAM and faster program execution. It has 64k of RAM on board and 60k is available for machine code program and data.

The company says PMS-E2P will run

Prolog, Lisp, Iso-Pascal, Comal, Ultracalc and Turtle Graphics with significant increases in speed and memory in addition to more popular languages like Basic and View.

The device uses a 6502A processor running at 2MHz and PMS says the standard benchmark timings show it is on a par with the BBC Micro in all modes.

Programs which

involve graphics manipulation show even larger speed increases.

The add-on requires no modifications to the Electron and is compatible with the Plus 3 and Cumana disc interfaces.

The PMS-E2P follows the Acorn Tube protocols and all software written to these standards will operate correctly, says the company. The price will be £89.



# NEWSLETTER

## MicroLink for import export organisation

ONE of Britain's leading import-export organisations has chosen MicroLink as the communications medium for its near 10,000 members around the world.

The prestigious British & Overseas Institute of Import Export Traders is a totally non-profit association run solely by its members who volunteer for election as officers.

It was founded in 1972 by a group of small companies and individuals who pooled their resources and knowledge to start a joint export sales drive to promote their respective products in Europe.

From this small beginning the Institute has grown to be a highly respected organisation with members all over the world.

"As its main function is to bring exporters into contact with overseas importers, it is a logical progression to require a quick and efficient standard means of communication", a spokesman said.

"As a result of this requirement the products and services committee of the Institute recommended all members to start using electronic mail".

Bill Vickerman, chairman, and Bob Pinder, senior

exports consultant – both based in Liverpool and already MicroLink users – said they chose MicroLink because it was reasonable in cost and highly effective in its means of communicating with members.

"It is a quick means of spreading the information that our members need to conduct their business efficiently", said Mr Vickerman.

"It is also a British service that is constantly bringing out new and better means of communication and in its way is a vital aid to our continual search for further British export trade".

## New news service

MEMBERSHIP of MicroLink doesn't just mean access to its broad range of communications and other value added services. It also opens the door to a wealth of information on the host Telecom Gold system.

The main MicroLink menu makes it simple to dial up the many fascinating databases on Telecom Gold.

Latest addition to the list is World Reporter, a massive full-text database of international news, current affairs and business information, operated by Datasolve.

Its sources include some of the world's leading news gatherers including the Financial Times, Washington Post, The Guardian and the BBC.

## Log-on to book in

MORE good news about the International Official Airline Guide, which was added to MicroLink's growing list of value added services last month.

As well as supplying the very latest data from more than 750 airlines worldwide – with details of 1½ million flights – and ensuring trouble-free and more economical flight arrangements, OAG also takes the strain out of choosing a hotel at the other end of your journey.

The same source that provides you with unbiased, up-to-date flight and fare information now brings a world of hotel and motel listings to your computer

terminal. Through the medium of MicroLink you can press a few keys and view over 17,000 North American hotels, more than 9,000 in Europe and 3,000 in the Pacific area.

You simply tell the OAG Electronic Edition the city you're going to and the location you prefer – near the airport, downtown or in a nearby suburb or resort – and in seconds you get a comprehensive alphabetical listing of hotels and motels in the location you've selected.

These come complete with name, address, telephone numbers, range of room rates and quality ratings.

## Here's YOUR chance to join MicroLink

All you need to use MicroLink is a computer, modem, appropriate communications software and a telephone. Fill in this coupon below for details on how to join:

Please send me an application form to join MicroLink.

My computer is .....

My modem is .....

I do not have a modem.

☐ Please send details.

Name .....

Address .....

.....

.....

POST TO: MicroLink, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.



# HERE'S HOW TO DRAW THE LINE AT COORDINATES

Part Five of the Electron graphics  
series by TREVOR ROBERTS

WE have already seen how we could get our Electron to draw lines on the screen. To do this we used the keywords **MOVE** and **DRAW** along with a pair of coordinates.

These coordinates came from dividing the screen into 1280 parts horizontally and 1024 vertically.

However we saw that we couldn't switch these points on and off individually, we had to take them in blocks.

The size of these blocks, or pixels, vary with the mode the Electron is in. Program I should help refresh your memory.

This fills the screen with a grid of lines. Line 20 puts the micro into Mode 1, the four colour graphics mode we'll be sticking to for the rest of the article.

Lines 30 to 60 form a **FOR . . . NEXT** loop with control variable *vertical*. This varies from 0 to 1279 in steps of 16. The **MOVE** of line 40 returns the graphics cursor to the bottom of the screen, Y coordinate 0.

The **DRAW** of the next line promptly draws a line from that point to the top of the

screen, Y coordinate 1023.

As *vertical* increases in value a series of vertical lines is drawn starting at the left edge of the screen and moving across it to the right.

The next loop does the same thing, except now the lines are drawn across the screen from the left - X coordinate 0 - to the right - X coordinate 1279.

Don't be content with just looking at the listing. Try changing the program. Why have I picked a step of 16 and not 8 or 12? Try it and see.

Can you make the vertical lines appear from right to left and the horizontal from top to bottom? And what about some diagonal lines?

When you've tired of that and strained your brain thinking of coordinates have a look at Program II. This has the Electron deciding on the coordinates for you.

There's no great mystery involved in the code. Line 20 selects Mode 1 again and line 30 switches off the flashing cursor.

The **FOR . . . NEXT** loop of lines 40 to 70 cycles 100 times, producing in all 100 lines. Each time round the loop line 50 **MOVES** the graphics cursor to the centre of the screen, 640,512. Line 60 **DRAWs** the lines.

As ever the **DRAW** command is followed by two coordinates to tell the micro which point to draw the line to. Now, however, the micro itself chooses the point.

The X coordinate is supplied via the Electron's random

number generator with the use of a **RND(1279)**. **RND(1023)** supplies the Y coordinate.

Notice that these numbers allow the line to be drawn to any point on the screen. What do you think would happen if we allowed numbers that went off the screen with a line like:

```
60 DRAW RND(2000),RND(2000)
```

Try it and see. Leave out line 50 and explain the results.

Now all these patterns are nice, but if, like me, you're bursting with artistic talent it won't be long until your muse inspires you to produce a masterpiece woven from **MOVES** and **DRAWs**. Program III shows the result in my case.

Eat your ear off Van Gogh. Well maybe not, but it is at least vaguely recognisable as a house.

All I did to create the program was draw the outline of a piece of squared paper and estimate the coordinates. Then I just strung them together with a set of **MOVES** and **DRAWs**.

As you can see the method works, but I'm not too impressed with it.

If I went on to elaborate the building, say with a chimney or doors and windows, then I'd end up with a program that would be a long string of **MOVES** and **DRAWs**. Program IV shows a better way of tackling the same problem.

Here the program has only one **DRAW** and one **MOVE**, yet it does the same job. This is

```
10 REM Program III
20 MODE 1
30 REM BOX
40 MOVE 100,100
50 DRAW 400,100
60 DRAW 400,300
70 DRAW 100,300
80 DRAW 100,100
90 REM ROOF
100 MOVE 100,300
110 DRAW 150,400
120 DRAW 350,400
130 DRAW 400,300
140 DRAW 100,300
```

Program III

because the graphics commands are stuck inside a loop while the coordinates they use are held in the **DATA** lines at the end of the program.

As the loop cycles it reads values into three variables - *switch*, *x* and *y*. If *switch* is 1 the program **MOVES** the graphics cursor to point *x,y*.

If *switch* is 2 then *x,y* is **DRAWn** to. The final data line just contains sentinel values that stop the loop. If you wonder why there are three of them try:

```
140 DATA 3
```

and see the resulting error message. If you want an example of a tricky little bug try replacing lines 60 and 70 with:

```
60 IF switch=1 THEN MOVE
x,y ELSE DRAW x,y
```

which may at first sight appear to do the same thing.

Another way of lessening

```
10 REM Program I
20 MODE 1
30 FOR vertical=0 TO 1279 STEP 16
40 MOVE vertical,0
50 DRAW vertical,1023
60 NEXT vertical
70 FOR horizontal=0 TO 1279 STEP 16
80 MOVE 0,horizontal
90 DRAW 1279,horizontal
100 NEXT horizontal
```

Program I

```
10 REM Program II
20 MODE 1
30 VDU 23,1,0;0;0;0;
40 FOR loop=1 TO 100
50 MOVE 640,512
60 DRAW RND(1279),RND(1023)
70 NEXT loop
```

Program II



the clutter of MOVES and DRAWS that tend to accumulate in graphics programs is to use procedures to lump together the commonly used bits of artwork code. Program V shows what I mean.

If you look at PROCsquare you'll see that it consists of one MOVE and four DRAWS.

The procedure takes the point *xbase,ybase* as the bottom left-hand corner of the square and using *side* works out the coordinates of the other corners. Combining these with the appropriate keywords produces a square on screen.

Lines 30 to 80 of the program call the procedure up to 10 times. Each time the bottom left-hand corner of the square is positioned randomly and *length* varies between 0 and 200.

Notice that the figures in the RNDs of lines 50 and 60 are the screen dimensions reduced by 200. This ensures that even the largest square will fit on the screen.

Try changing the procedure so that it produces a rectangle at point *xbase,ybase* with sides of length *length* and breadth *breadth*. Why not use

it with Program II or Program IV to give the house doors, windows or even a chimney?

You could store whole elements of pictures in procedures, calling them as necessary. The only limit is your imagination, as people on television micro shows are fond of saying.

Once you've got a procedure figured out you can use it in all sorts of ways. Program VI shows our PROCsquare used to produce some nice patterns.

Although our old PROCsquare forms the basis of the program the output is completely different. This is because the parameters passed to the procedure are different.

Lines 30 to 50 give them initial values. The REPEAT... UNTIL loop formed by lines 60 to 100 then alters their value and calls PROCsquare. It's this that causes the pattern to appear.

Try changing lines 70 and 80 to lines like:

```
70 bottomLeftX=bottomLeftX
+ 10
80 bottomLeftY=bottomLeftY
- 10
```

adding or subtracting different values each time. It's surprising how the output changes with just a minor alteration to the code.

That's all about MOVE and DRAW down in black and white. But what of coloured lines, as promised last time?

You'll recall that when we wanted coloured text we just used the COLOUR command. We can't use COLOUR to give us coloured lines, but what we can use is the GCOL - Graphics COLOUR - command. The format of the command is:

```
GCOL 0,logical colour
number
```

where the logical colour number is exactly the same as the one we used with COLOUR. Remember our talk of paint brushes or pens?

Mode 1, which we've been

```
10 REM Program V
20 MODE 1
30 FOR loop=1 TO RND(10)
40 length=RND(200)
50 bottomLeftX=RND(1079)
60 bottomLeftY=RND(823)
70 PROCsquare(bottomLeftX,bottomLeftY,length)
80 NEXT loop
90 END
100 DEF PROCsquare(xbase,ybase,side)
110 MOVE xbase,ybase
120 DRAW xbase,ybase+side
130 DRAW xbase+side,ybase+side
140 DRAW xbase+side,ybase
150 DRAW xbase,ybase
160 ENDPROC
```

Program V

using in our programs, is a four colour mode, so we have available:

```
0 black
1 red
2 yellow
3 white
```

As the background is normally black it may seem daft to want to draw lines in black, but it does come in useful at times. Think of erasing lines if you don't believe me.

White is the default graphics colour at switch - on or mode change. Let's use GCOL to draw a red line. Put the Electron into Mode 1, if it isn't already, with:

```
MODE 1
```

which will automatically position the graphics cursor at 0,0 - the bottom left of the screen. Then select red with:

```
GCOL 0,1
```

Notice that the text colour doesn't change - it's still white. Now draw a line to the centre of the screen with:

```
DRAW 640,512
```

and if all is well you'll see a red line. Select yellow with:

```
GCOL 0,2
```

```
10 REM Program VI
20 MODE 1
30 bottomLeftX=500
40 bottomLeftY=500
50 side=200
60 REPEAT
70 bottomLeftX=bottomLeftX+10
80 bottomLeftY=bottomLeftY+10
90 side=side-20
100 PROCsquare(bottomLeftX,bottomLeftY,side)
110 UNTIL side<20
120 END
130 DEF PROCsquare(xbase,ybase,side)
140 MOVE xbase,ybase
150 DRAW xbase,ybase+side
160 DRAW xbase+side,ybase+side
170 DRAW xbase+side,ybase
180 DRAW xbase,ybase
190 ENDPROC
```

Program VI

and your diagonal is completed in yellow by:

```
DRAW 1279,1023
```

That's all we're doing on GCOL for the moment although there's an awful lot more to it, as you'll know if you've glanced at the manual.

Now that you've learnt to unleash the Electron's colours try using them in some of the previous programs. In Program I you'll find that the lines:

```
25 GCOL 0,1
65 GCOL 0,2
```

produce a yellow and red grid that looks a sort of brown/orange mixture. Program II is transformed with:

```
55 GCOL 0,RND(3)
```

while:

```
65 GCOL 0,RND(3)
```

works for Programs IV, V and VI.

● On that colourful note we'll leave it for now. Next month we'll be looking into windows.

```
10 REM Program IV
20 MODE 1
30 switch=0
40 REPEAT
50 READ switch,x,y
60 IF switch=1 THEN MOVE
x,y
70 IF switch=2 THEN DRAW
x,y
80 UNTIL switch=3
90 DATA 1,100,100,2,400,
100
100 DATA 2,400,300,2,100,
300
110 DATA 2,100,100,1,100,
300
120 DATA 2,150,400,2,350,
400
130 DATA 2,400,300,2,100,
300
140 DATA 3,3,3
```

Program IV



# Star of the command performance

HAVE you been following Robin Nixon's series, Extra Commands? It started in the May 1986 issue of *Electron User* and shows how to add your own commands to Basic, like WHILE/WEND and BEEP.

This month I'm going to show how disc owners can add extra commands, not to Basic though, but to the operating system using star commands. This is much easier as you'll see, but first we need to know what happens to star commands.

When Basic — or any language for that matter — encounters a star command such as \*CAT, either within a program or when entered directly from the keyboard, it is passed straight to the operating system (OS). Basic has nothing to do with it.

The OS will check the name

of the command against the ones in its command table, and if there's a match it will jump to the appropriate routine to execute it.

So \*CAT will catalog the disc or tape. What interests us is what happens when the OS doesn't recognise the name.

First it is offered to any ROMs that are present. Each ROM will check the name against its own list of commands in its command table and decide whether to accept or reject it. If there's a match it

accepts it, otherwise it is rejected.

If the command is not claimed by any of the ROMs the OS will offer it to the currently selected filing system. The filing system only has a limited time in which to act on it and if it can't react fast enough the command is rejected. Try:

\*TAPE  
\*BEEP

None of the ROMs should accept \*BEEP and since the

tape filing system is slow it cannot respond quickly enough so you will get "Bad command".

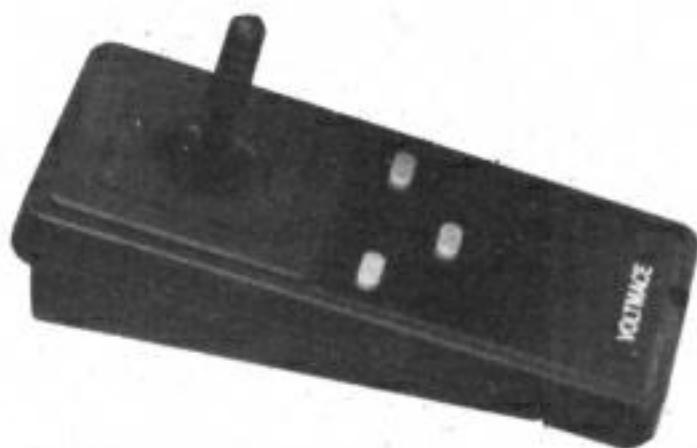
Press Ctrl+D+Break if you have DFS and Ctrl+A+Break if you have ADFS. Now try:

\*BEEP

and you'll see the disc drive start up. The disc filing system is pretty quick so it attempts to respond to the command.

What it is doing is looking for a file on the disc called BEEP. If it can't find one it will

## JOYSTICKS— THE COMPLETE SOLUTION



### DELTA 3B SINGLE—BBC B or ELECTRON PLUS 1 £12.00

A single joystick that in some ways can act as two. The custom made special "low noise" potentiometers are wired so that it will work as a left hand or right hand joystick. It can even run some programs written for two joysticks and has the fire buttons of both.

### DELTA 3B TWIN—BBC B or ELECTRON PLUS 1 £19.95

A direct but improved alternative for the original ACORN joysticks, with 2 joysticks wired to one plug. As with all our joysticks they have the fast action sprung to centre return of the steel shafted nylon covered joystick. The light action makes them ideal to hold and the 3 fire buttons allow left or right-handed use.



Available from your dealer  
or direct from us



# Voltmace Limited

Park Drive  
Baldock  
Herts  
SG7 6EW  
Telephone (0462) 894410



print Bad command as before.

However if it does find one it will get its load and execution addresses and, using these, \*LOAD it and call it automatically. The file must be a machine code program.

Enter and run Program I. This is a very short assembly listing that creates a machine code program and saves it to disc with the name BEEP.

It assembles to page &C which the OS uses to store character definitions, but since

```
10 REM PROGRAM I
20 FOR i=0 TO 2 STEP 2
30 PX=&C00
40 [ OPT i
50 LDA #7
60 JSR &FFEE
70 RTS
80 ]
90 NEXT
100 *SAVE BEEP C00 +10
```

Program I

we aren't defining any characters it won't be needed.

BEEP is a simple routine which loads the A register with 7 and calls &FFEE - with the

same effect as VDU 7. If you CALL &C00 to run the machine code routine you'll hear a beep.

Press Break to clear the memory and again try:

\*BEEP

and after a short pause you'll hear a beep. You've added an extra star command to your Electron.

Compare the length of Program I with Robin's equivalent program in the May 1986 issue and you'll see how much easier it is to add star commands.

Program II is a simple demonstration of the new command. You can see it in line 40. As with all star commands you cannot embed it in the middle of a multi-statement line, it must be the last command on the line.

If you run Program II there will be a slight delay as BEEP is loaded before executing it. This is the price we pay for storing extra commands on disc.

The faster the disc system the faster the response to the command. Notice that the

```
10 REM PROGRAM II
20 PRINT "Press a key"
30 key=GET
40 *BEEP
45 FOR i=1 TO 1000:NEXT
50 PRINT "It worked!"
```

Program II

Basic program carries on as normal after the \*BEEP.

You can add many different commands using this method. In fact you're only limited by the number of files you can fit on a disc, and since a command is loaded only as and when it is needed you aren't limited by the Electron's memory.

Program I was a short and simple machine code program, but needn't necessarily be so. Program III is a much longer and more complex command. Enter and run it. The program will assemble a machine code program which is then saved to disc as FILL.

As the name suggests it's a fill routine. To use it to paint an area of the screen set the graphics colour with GCOL, MOVE to the starting point

and \*FILL will fill the area.

Although not the best fill in the world it does show how powerful this system of extra commands can be.

Program IV is a graphics program demonstrating the new fill command. It draws a yacht and colours it in using \*FILL.

Remember that this method of adding commands requires that you have a disc in the drive - and \*MOUNTed if you have a Plus 3 - and that the files are present in the current directory or the library directory.

As you've seen from these examples any machine code program can be run simply by entering \*NAME and this is treated like any other operating system command. I've shown you two new commands and I'm sure you can think of many more.

```
10 REM PROGRAM III
20 REM *FILL
30 osword=&FFF1:oswrch=&FFEE
40 x=&70:y=&72:colour=&7
50 FOR pass=0 TO 2 STEP 2
60 PX=&C00
70 [ OPT pass
80 LDA #0:LDX #block M
OD256:LDY #block DIV256:JSR
osword \get x,y
90 LDA block+4:STA x:LDA
block+5:STA x+1 \store x
100 LDA block+6:PHA:STA y
:LDA block+7:PHA:STA y+1 \
store y
110 JSR point:STA colour
\get pixel colour
120 LDA #10:JSR oswrch:LD
A #0:JSR oswrch:CLC:LDA col
our:ADC #120:JSR oswrch \GC
OL0,pixel+120
```

```
130 .up
140 JSR point:CMP #255:BE
Q down:CMP colour:BNE down
150 JSR line
160 CLC:LDA y:ADC #4:STA
y:LDA y+1:ADC #0:STA y+1 \y
=y+4
170 JMP up
180 .down
190 PLA:STA y+1:PLA:STA y
\get start y
200 .d1
210 SEC:LDA y:SBC #4:STA
y:LDA y+1:SBC #0:STA y+1 \y
=y-4
220 JSR point:CMP #255:BE
Q end:CMP colour:BNE end
230 JSR line
240 JMP d1
250 .end
260 RTS
270
280 .point \POINT(x,y)
290 LDA x:STA block:LDA x
+1:STA block+1 \set up blo
```

```
ck
300 LDA y:STA block+2:LDA
y+1:STA block+3
310 LDA #09:LDX #block M
OD256:LDY #block DIV256:JSR
osword
320 LDA block+4 \get col
our
330 RTS
340
350 .line
360 LDA #25:JSR oswrch:LD
A #77:JSR oswrch \PLOT 77,x
,y
370 LDA x:JSR oswrch:LDA
x+1:JSR oswrch
380 LDA y:JSR oswrch:LDA
y+1:JSR oswrch
390 RTS
400
410 .block
420 EQU 0:EQU 0
430 ]
440 NEXT
450 *SAVE FILL C00 +00
```

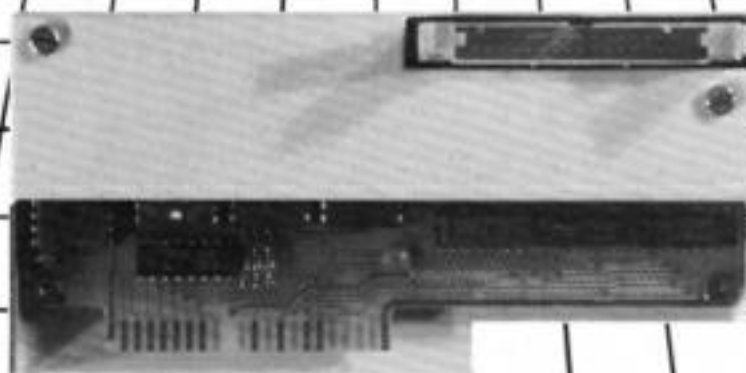
Program III

```
10 REM PROGRAM IV
20 MODE 2
30 VDU 23,1,0;0;0;0;
40 MOVE 300,500:DRAW 800
,500:DRAW 700,400:DRAW 400,
400:DRAW 300,500
50 MOVE 0,450:DRAW 350,4
50:MOVE 1200,450:DRAW 750,4
50
60 MOVE 300,540:DRAW 500
,540:DRAW 500,900:DRAW 300,
540
70 MOVE 600,540:DRAW 800
,540:DRAW 600,900:DRAW 600,
540
80 MOVE 100,100:GCOL 0,4
:*FILL
90 MOVE 900,430:*FILL
100 MOVE 574,550:GCOL 0,1
:*FILL
110 MOVE 610,560:GCOL 0,2
:*FILL
120 MOVE 640,475:GCOL 0,5
:*FILL
130 MOVE 10,800:GCOL 0,6:
*FILL
140 MOVE 1000,800:*FILL
150 MOVE 1000,475:*FILL
160 MOVE 590,800:*FILL
170 MOVE 590,500:GCOL 0,0
:DRAW 590,950
```

Program IV



# Advanced Computer Products



## THE ADVANCED PLUS FOUR

*"Disc drive compatibility at long last".*  
**ELECTRON USER, JUNE '86**

### The Advanced Plus Four (A.P.4.)

- A FULLY ACORN COMPATIBLE disc I/face for the 'ELK' & Plus 1
- Accepts any standard 5¼" or 3½" disc drive with PSU
- Supplied with 1770 DFS (as supplied on the B+ & Master series)  
(A.E.D. is still available for Plus 3 users @ £24.15 inc.)
- Page stays @ &E00, the same as Tape-F.S. NO LOSS of RAM
- Will allow more tape software to be run from disc
- Access compatible BBC disc-based software. No conversion program needed
- Extra sideways ROM socket fitted as standard (will take ADFS when available)
- A self-contained, well finished and fully tested product
- No 'short cuts' in design, finish or components
- ROM s/ware includes format, verify, free space and utils.
- Achieve greater BBC compatibility **£69.55 (+VAT)**

INTRODUCTION PACKAGES OF A.P.4. AND DISC DRIVES AVAILABLE. PLEASE PHONE FOR PRICES

*"I can recommend it to anyone contemplating upgrading to disc".* **ELECTRON USER, JUNE '86**

### The Advanced Rom Manager

A friendly utility for ROM and sideways RAM users.

#### FEATURES:

- Compatible with Master series, BBC, B+ and Electron
  - Bi-directional Hex/Ascii/65C02 disassembler ROM editor
  - Turn off ROMs
  - Make files suitable for ROMs
- A.R.M commands allow you to:
- Load and run programs from sideways RAM
  - Offer commands to specific ROMs
  - Creates files suitable for the ROM filing system
  - ROM and sideways RAM memory editor
  - Loads ROM program into sideways RAM
  - Moves memory to/from sideways RAM/ROM
  - Saves ROMs onto disc/tape
  - Generates a ROMs checksum and CRC
  - Disables unwanted ROMs permanently
  - Start execution of a machine code programming in ROM

Special anniversary price celebrating A.C.P.'s first year of trading.

**ONLY £9.99 incl.**

*Order details and other products see our main ad on Page 2.*

**A.C.P. 6 Ava House, High Street, Chobham, Surrey GU24 8L2.**

**Tel: (0276) 76545**



Programs: Cash Care £11.95  
(cassette) £13.95 (disc)  
Vat Care £14.95 (cassette)  
£16.95 (disc)  
Building Society Care £9.95  
(cassette) £11.95 (disc)  
Supplier: Squirrel Software,  
4 Bindloss Avenue,  
Eccles, Manchester M30  
ODV. Tel: 061-789 4120

## Careful approach to cash

PEOPLE who wish to do the simple tasks well need look no further than The Care Utility Series from Squirrel Software. I have tested three of

Squirrel's programs:

● Cash Care copes with up to 60 categories of income/expenditure in either one or two accounts.

● Vat Care produces the three-monthly VAT liability reports on up to 150 sales or purchase postings per month.

● Building Society Care handles a maximum of 208 deposits, withdrawals or rate changes in any year to a building society account, thereby allowing one to know the interest earned at any given time.

It is a great compliment when I say that Cash Care is the sort of program which

you'd wish you could produce at home over a weekend.

At the cost of a take-away meal, Squirrel have taken all the chore out of getting a useful program.

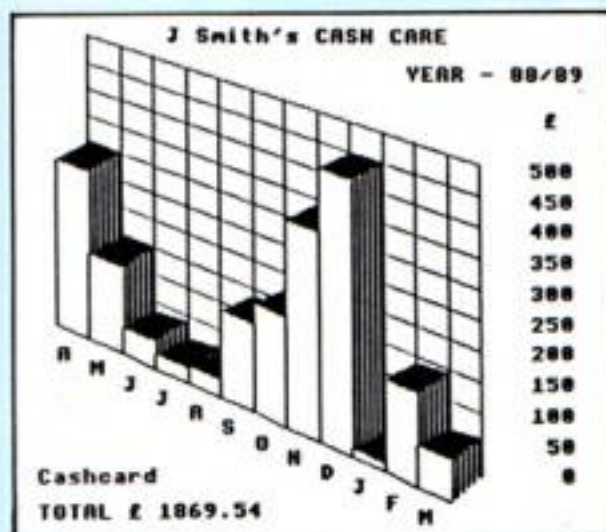
Vat Care adopts the same no frills approach. For the small tradesman who loathes keeping the books and is not interested in copious management information, this is the ideal system.

Whereas Bank and Vat Care work on the time honoured debit-credit-plonk principle, Building Society Care is more like a spreadsheet. This is so that you may experiment in order to test the effect of money being moved around.

Each row represents a transaction, while each cell of the matrix represents the detailed effect the transaction has upon the account.

At a cost of £10 to £15 each they represent excellent value for money.

Jo Stork



J. EVERMAN'S VAT CARE			
Three month period to end August 88 - SALES			
Invoice	Debit	Vat	Net
C/Amount £	£	£	£
June 88			
AMPL 001	122.44	16.10	107.34
WENDY 002	421.94	56.24	365.70
SONDERVOO 003	515.47	67.42	448.05
JONES 004	41.40	5.40	36.00
CLARK 005	41.10	5.39	35.71
HOPE 006	262.27	34.21	228.06
LEWIS 007	517.11	67.45	449.66
MURK 008	2450.99	319.70	2131.29
ALLIED 009	312.66	40.65	272.01
ROBBY 010	1000.12	130.04	870.08
GARAGE 011	60.27	7.84	52.43
STATION 012	24.00	3.12	20.88
SPRUE 013	1726.77	224.49	1502.28
CONCELO 014	89.00	11.58	77.42
EXDISTR 015	344.47	44.78	299.69
ACME 016	605.70	78.74	526.96
FORTE 017	100.47	13.06	87.41
ZENTO 018	436.34	56.73	379.61
GENEL 019	430.42	56.05	374.37
FOOD 020	190.45	24.76	165.69
Subtotal £	12410.06	1615.44	10794.62

J. EVERMAN									
GOODSHIPS B.V.S.									
ENTRY	TYPE	AMOUNT	DATE	DAVS	INT. %	INTEREST	Wgt/BALANCE		
1	D	4000.00	12/1/88	12	9.25	27.64	11777.00		
2	M	24.76	15/1/88	2	9.25	6.01	11742.44		
3	M	55.00	22/1/88	6	9.25	27.99	11687.44		
4	F	0.00	1/2/88	4	9.25	26.87	11687.44		
5	D	450.00	2/2/88	2	10.25	9.81	12127.44		
6	D	200.00	22/2/88	19	10.25	44.88	12237.44		
7	M	390.00	24/2/88	1	10.25	7.45	11947.44		
8	M	22.00	26/2/88	4	10.25	17.78	11929.66		
9	D	76.00	1/3/88	4	10.25	17.78	11901.88		
10	D	4000.00	15/3/88	11	10.25	76.91	10981.88		
11	M	56.72	22/3/88	9	10.25	25.90	10914.14		
12	D	32.01	27/3/88	6	10.25	20.90	10893.24		
13	F	0.00	1/4/88	4	10.25	17.20	10876.04		
14	M	24.00	4/4/88	7	7.25	9.17	10812.72		
15	M	99.47	11/4/88	1	7.25	21.27	10752.95		
16	D	60.00	12/4/88	1	7.25	7.07	10692.95		
17	D	25.00	14/4/88	2	7.25	9.08	10627.85		
18	M	240.74	19/5/88	20	7.25	99.84	10528.01		
19	F	0.00	2/6/88	16	7.25	47.43	10480.58		
20	D	60.00	12/6/88	10	5.00	20.92	10459.66		
21	M	677.00	14/6/88	1	5.00	2.06	14412.11		
22	M	7000.00	20/6/88	6	5.00	11.91	7412.11		
23	F	0.00	26/6/88	10	5.00	11.17	7412.11		
BALANCE NOW: 0.000 interest for 102 days at £ 536.84 x £ 7948.95									

Sound .....	N/A
Graphics .....	8
Ease of use .....	9
Value .....	10
Overall .....	9

Program: Bullseye  
Price: £7.95  
Supplier: Macsen, 17 Nott  
Square, Carmarthen,  
Dyfed SA31 1PQ. Tel:  
0267 232508

## Bullseye loses on points

ELECTRON owners can now experience the tension of ITV's popular dart throwing quiz called Bullseye. The game's format faithfully follows that of the TV program except that it involves just two players.

The first part involves throwing a single dart at a board divided into eight segments. If you hit the area you aimed for you win points and get a question.

A correct answer to the

question earns you more points. A wrong answer means your opponent can try to answer it.

Each player has three turns at this and points can only be scored when the section is hit for the first time.

Round two uses a standard match play dartboard. Again the players take turns to throw darts and the person with the highest score earns a question. If this is answered correctly, the darts' score is added to that player's total.

After three rounds the winner moves on to the prize board. Nine darts are thrown and if they land in the small red sections more points are won.

The fourth part of the game involves a gamble. If you can score 101 or more with four darts your score is doubled. If you fail your score is halved.

The graphics are good, with

the dart board drawn quickly and neatly. Bully is drawn even more quickly and he bears a good likeness to the TV version.

Even the text is well presented using an unusual, but clear, set of characters.

A couple of spelling bugs are an irritant. I'm not an expert at darts but I thought the line you stand at was called the oche. Macsen have their own version.

I'm also left wondering how they want me to spell the Greek philosopher Plato. With several files of questions, I suppose a couple of mistakes are inevitable. More annoying is the fact that the Plus 1 on the Electron has to be disabled first.

This game lacks a little something. The excitement of the TV program lies in the cash and prizes that competitors



win. Mere points seem very dull by comparison.

The darts throwing is also rather predictable. I could consistently throw twenties but the trebles were more elusive. Despite all this the game is quite fun to play if a little slow at times.

Rog Frost

Sound .....	5
Graphics .....	7
Playability .....	6
Value .....	5
Overall .....	6



**Program: Tennis**  
**Price: £2.99**  
**Supplier: Bug-Byte, Liberty House, 222 Regent Street, London W1R 7DB. Tel: 01-439 0666**

## Played out of court

SHOULD you be one of the many thousands of people who spend Wimbledon fortnight glued to the TV set you may have considered trying a computer simulation.

Bug-Byte have just released one such program, though I doubt whether it's destined to be a winner.

You have the option of playing one or three sets with

either four or six games per set.

Control is via keyboard or joystick and your opponent is always the computer — you cannot challenge a friend.

This is a pity as the computer provides such stiff opposition that you will normally only win one or two points during a complete set.

The court is drawn with perspective going into your screen, the computer always being at the top of the screen.

When serving, as in the real game, you must remember to keep your feet behind the baseline or you will be foot faulted.

Your player can travel left, right, and up and down the court, and balls can either be volleyed or taken as groundstrokes.

When volleying from the net I would suggest that you do not stand too close as you will tend to hit the ball out of court.

I can only assume that the angle of the shot which you play is determined by your position in relation to the ball, though I didn't find that this made too much difference.

The ball's flight and its associated shadow, was relatively smooth, although on several occasions it vanished for a fraction of a second in mid-flight.

The characters representing the players are large, angular and rather crude. The best part of the screen is the scoreboard where electronic style numbers display sets, points, and server.

Had the game employed a



user selectable skill option it would probably have had more lasting appeal. But in its present form I feel it would soon be abandoned by a thoroughly demoralised player.

**James Riddell**

Sound .....	6
Graphics .....	6
Playability .....	6
Value .....	6
Overall .....	6

**Program: Savage Pond**  
**Price: £2.99**  
**Supplier: Bug-Byte, Liberty House, 222 Regent Street, London W1R 7DB. Tel: 01-439 0666**

## Bargain in the pond

TO most people a frog is a small green slimy amphibian which sits lazily on a lily pad devouring passing flies. I too had this impression until I tried my hand at the tadpole survival course, otherwise known as the Savage Pond.

The screen displays a cross

sectional view of the pond. When the game begins the pond is quite barren except for a handful of hydra on the bottom.

Having emerged from one of three eggs you begin to stuff yourself with the nutritious amoebae which float in the water above.

These are useful for gaining points, but do little to aid your progress towards becoming a frog.

Froghood is achieved by consuming the worms which drift from the surface to the bottom. For every five worms consumed you take a step towards maturity, nine such steps and you become a frog.

Unfortunately for our wrig-

gling buddy, life is not a bed of lilies. Apart from the deadly hydra you must also cope with eggs dropped by passing dragonflies.

It is imperative that these are consumed before they reach the bottom because if they are allowed to hatch you will meet your maker at the jaws of a dragonfly larva.

For each step you take towards maturity a new hazard is introduced to the pond.

These take the form of jellyfish, spiders, and even radioactive waste.

Savage Pond was reviewed in this magazine over 18 months ago and received a very favourable reception. It



has now been re-released at less than half the price and is therefore a bargain not to be missed.

**Carol Barrow**

Sound .....	7
Graphics .....	7
Playability .....	8
Value .....	8
Overall .....	8

**Program: Jack Attac**  
**Price: £2.99**  
**Supplier: Bug-Byte, Liberty House, 222 Regent Street, London W1R 7DB. Tel: 01-439 0666**

## Stay ahead of the giant

ONCE upon a time there was a young man named Jack who had a beautiful girlfriend called Jill — until the local giant incarcerated her in his castle.

Being a brave sort of chap

Jack decided to enter the castle to attempt a rescue.

The castle takes the form of a 45 screen maze which you must negotiate in order to find the key which will unlock Jill's dungeon.

Different areas are sealed off by coloured doors. These are unlocked by coloured keys which are to be found around the castle.

I don't know if the giant is a greengrocer in his spare time but the castle is littered with pieces of fruit. Every one must be collected before you are allowed to free Jill.

As soon as you have released your beloved, the giant will awaken. You must therefore escape from the castle within the next two minutes.

The 45 screens do not need to be completed in sequence, and you are free to wander from place to place as you seek the next key.

Each screen is big, colourful and normally patrolled by a nicely detailed bad guy.

There are also secret passages which can take you from one section to another without the need for a key. I found Jack



Attac a well written, fun to play, and sensibly priced program.

**James Riddell**

Sound .....	7
Graphics .....	7
Playability .....	8
Value .....	8
Overall .....	8



Program: *Terrormolinos*  
Price: £6.95

Supplier: Melbourne House,  
60 High Street, Hampton  
Wick, Kingston-upon-  
Thames, Surrey KT1 4DB.  
Tel: 01-943 3911

## The game in Spain...

THIS is the best adventure game I have yet seen from Melbourne House.

The object of the adventure is to go on holiday with your family to Spain, taking 10 photographs while you are there. All the photographs have to be taken in the right

places and it is up to you to find out where they are.

You start at home. A taxi is due soon to take you to the airport and you must search the house for the things you will need in Spain and get your family together before it arrives.

On arrival you check in at your hotel (make sure it is the right one) and change into more suitable attire before visiting the local shops.

An exploration of the nearby beach will lead to a rewarding encounter with a shark.

You should now sample the nightlife, though the red light district has nothing to do with developing your photographs.

You will find that three coach trips are laid on so remember to take your camera. A colloquial insult will help you to find the missing passenger at the monastery.

The problem that I get asked most is how do you avoid being killed by the bull?

This is solved by remembering that you do not need to protect your head at the moment and by allowing it to break some crockery.

As is immediately apparent from the title, the adventure is very tongue-in-cheek. Unlike Hampstead, where the humour seemed laboured, *Terrormolinos* hits the right note every time.

Paul Gardner



Presentation .....	7
Atmosphere .....	8
Frustration factor .....	8
Value .....	7
Overall .....	8

Program: *Jet Set Willy*  
Price: £7.95

Supplier: Tynesoft, Addison  
Industrial Estate, Blaydon,  
Tyne & Wear NE21 4TE  
Tel: 091-414 4611

## Life is hard for Willy

MANIC Miner was a ladders and levels game which graced just about every home computer on the market. As with most successful games it was quickly followed by a sequel, in this case *Jet Set Willy*.

Having escaped from the mine, Miner Willy wasted no

time at all in spending his new found wealth. After buying a mansion and yacht he decided to throw a party.

The party is a wild success but the housekeeper is rather upset about the aftermath. Willy is given an ultimatum: No sleep until all of the debris has been cleared.

When you live in a 100 room mansion that is some headache.

With *Manic Miner* each individual screen had to be completed before starting the next. With *Jet Set Willy* there are no such constraints – you as Willy can wander from screen to screen at will.

However you will only be

awarded points for collecting the objects from the party.

When you load up the game for the first time you will see that you are provided with eight Willies. This might seem to be very generous but there is a problem.

Should you manoeuvre Willy into a position that will mean certain death, he will die. He will then be reincarnated in the very same position, unless you have lightning reflexes then he will die again, and again, and you will soon be minus several Willies. Once I lost all eight Willies in under three seconds.

On several occasions I entered the bedroom only to



be shown the way out by the irate housekeeper. What I can't understand is that if Willy can afford a 100 bedroom mansion why can't he get decent staff? Carol Barrow

Sound .....	7
Graphics .....	7
Playability .....	8
Value .....	8
Overall .....	8

Program: *Ian Botham's Test Match*  
Price: £7.95

Supplier: Tynesoft, Addison  
Industrial Estate, Blaydon,  
Tyne & Wear NE21 4TE  
Tel: 091-414 4611

## Botham plays on

RAIN may stop play on a regular basis at the Oval but it should cause few problems if you're playing *Ian Botham's Test Match*. The armchair enthusiast can now put willow to leather all year round.

The game allows one or two players to compete over 16 overs, 32 overs, or a full two

innings test match.

When playing against the computer you are always put in to bat first.

A choice of four strokes is available. They are selected by holding down the appropriate key and pressing the Return key to execute the stroke as the ball approaches.

The timing here is very difficult to judge. Unfortunately no matter what stroke the batsman plays he always performs the same movements.

Once your side has bitten the dust – and that won't take long – you position your fielders before bowling. Players are moved using a combination of four keys and set in position by pressing a

fifth. On several occasions I found that this positioning key had to be pressed numerous times before a player was released.

You are provided with a choice of four bowlers each having a different pace or style. Having selected fast, medium, spin, or bouncer, just press the Q key and the bowler will make his run up.

When fielding a ball you first move a cursor to the player you wish to move before you can begin to chase the ball.

Normally by the time you have made your selection the ball has reached the boundary.

An element of humour is provided by a little duck, complete with bat and cap,



which leaves the field with a tear in its eye as your exit for no runs.

The graphics used in the game are quite reasonable, it is just a pity that the game is so awkward to play.

John Revis

Sound .....	4
Graphics .....	6
Playability .....	5
Value .....	6
Overall .....	6



Now combined in  
two fun-filled  
packages... all  
the traditional  
card and board  
games you've  
been asking for  
- again and again!



9 Classic card &  
board games

No. 1



9 Classic card &  
board games

No. 2



Electron  
cassette  
can also  
be used on  
the BBC Micro

For the BBC Micro and Electron

For the BBC Micro and Electron

Electron  
cassette  
£5.95 each

3½" disc  
£7.95 each

TO ORDER, PLEASE USE THE FORM ON PAGE 53



THE Attributes Trail is a two player game in which you and your opponent score points by matching colours and shapes.

You move from square to square on a grid, trying to keep on the same shape or colour.

The game is educational fun for children aged five and over, and is also a brain teaser for adults.

Young children will only be looking one move ahead, but they will be learning about left, right, up and down, as well as shape and colour.

Cannier games players will work out some strategy, but as each square can only be visited once beware of getting blocked in.

You can increase the difficulty of the game either by reducing the time available for each move or by making it illegal to move to a square of the same colour as your opponent's. These options are given in the game.

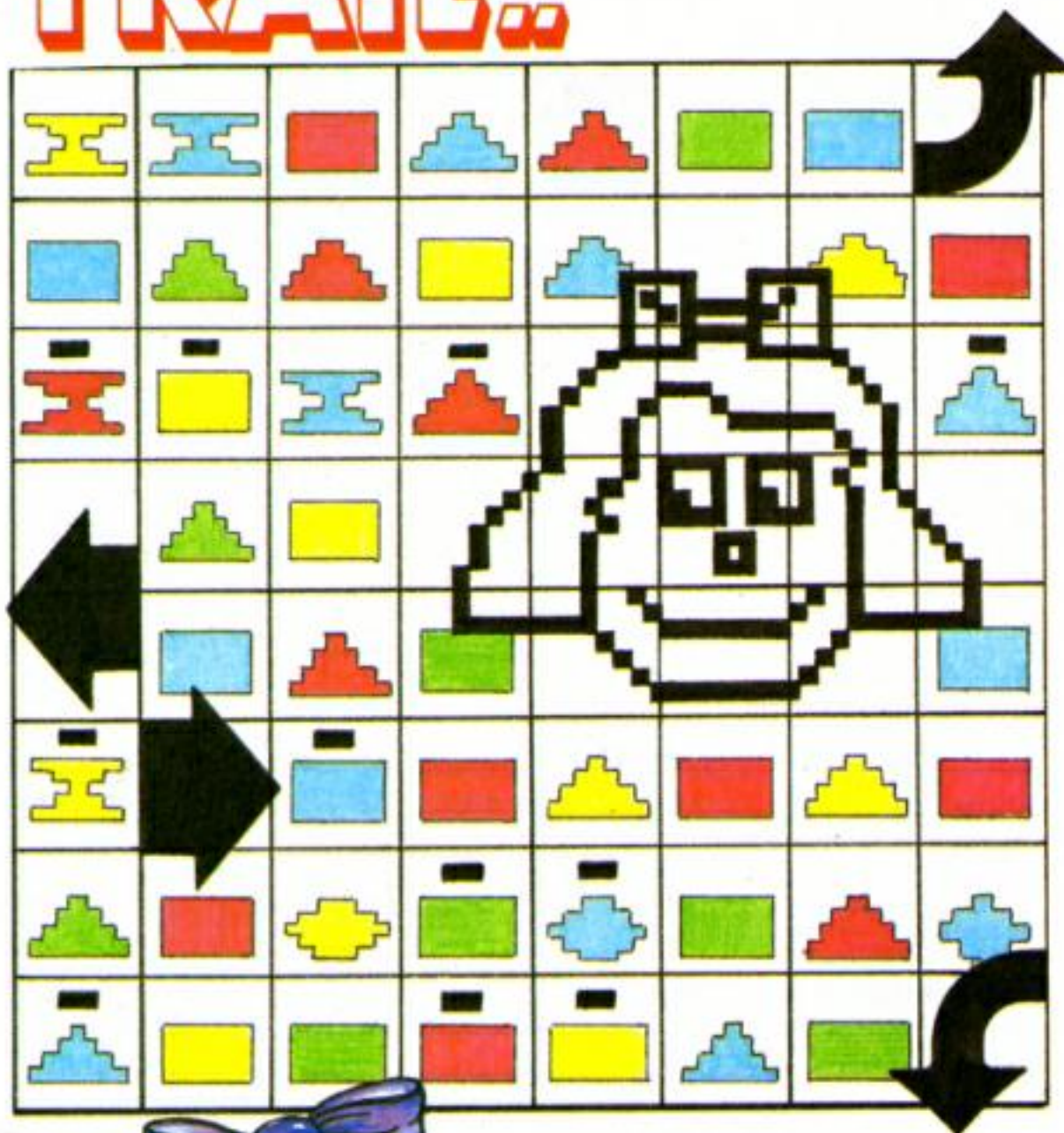
A feature of the program is the input routine for players' names. Instead of plain INPUT the letters in the name are taken one at a time and amended so that the name appears as a child would write it - first letter is upper case, remaining letters lower case.

The routine also detects spaces and full stops and puts the next letter in upper case.

At the end of the game the faces of the players are drawn with names and scores underneath.

# THE ATTRIBUTES TRAIL..

By ROG FROST



Full listing starts on Page 18



## PROCEDURES

**init** Defines characters and variables.  
**instruct** Prints instructions.  
**grid** Sets up the screen.  
**delay** A short pause.  
**end** Draws the faces at the end.

## VARIABLES

**col%(63)** Colour in each square.  
**shape%(63)** Shape in each square.  
**name\$(2)** Players' names.  
**move%** Number of goes taken.  
**direction\$** Player's requested move.  
**wait%** Time permitted for each move.



## From Page 17

```

10 REM Attribute Trail
20 REM By Rog Frost
30 REM (c) Electron User
40 IF PAGE>4000 GOTO2200
50 MODE6
60 ON ERROR GOTO2140
70 PROCsetup
80 PROCinstruct
90 REPEAT
100 MODE6
110 PROCinit
120 MODE2
130 PROCgrid
140 REPEAT
150 PROCplayerone
160 PROCplayertwo
170 UNTILmoveX>39
180 MODE5
190 PROCend
200 UNTILO
210 END
220 DEFPROCgrid
230 VDU23;8202;0;0;0;
240 FORgridX=200TO1000STE
P100
250 MOVEgridX,200:DRAWgri
dX,1000
260 MOVE200,gridX:DRAW100
0,gridX
270 NEXT
280 MOVE0,180:DRAW1279,18
0:MOVE0,120:DRAW1279,120:MO
VE0,60:DRAW1279,60
290 MOVE0,0:DRAW0,180:MOV
E1279,0:DRAW1279,180:MOVE64
0,180:DRAW640,120:MOVE430,1
20:DRAW430,0:MOVE860,120:DR
AW860,0
300 PRINTTAB(1,27);name$(
1)TAB(13,27);name$(2)
310 PRINTTAB(7,29)"Score"
TAB(7,31)"Turns"TAB(0,0);
320 PRINTTAB(3,29)"0"TAB(
15,29)"0"
330 PRINTTAB(3,31)"20"TAB
(15,31)"20"TAB(0,0);
340 VDU5
350 FORcellX=0TO63
360 GCOL0,colX(cellX):MOV
EcellX MOD 8*100+220,cellX
DIV8*100+250:PRINTCHR$shape
X(cellX)
370 NEXT
380 GCOL0,7:MOVEposoneX M

```

```

OD 8*100+220,posoneX DIV8*1
00+280:PRINT"*"
390 MOVEpostwoX MOD 8*100
+220,postwoX DIV8*100+280:P
RINT"*"
400 VDU4
410 ENDPROC
420 DEFPROCplayerone
430 VDU5:GCOL0,15:MOVEpos
oneX MOD 8*100+220,posoneX
DIV8*100+280:PRINT"*"
440 GCOL0,7:MOVEpostwoX M
OD 8*100+220,postwoX DIV8*1
00+280:PRINT"*"
450 VDU4
460 COLOUR8:PRINTTAB(1,27
);name$(1):COLOUR7:PRINTTAB
(13,27);name$(2)
470 PRINTTAB(3,31)" *TA
B(3,31);21-(moveX+2)DIV2TAB
(0,0);
480 *FX15,0
490 direction$=INKEY$(wai
tX)
500 moveX=moveX+1
510 IF(direction$="U"OR d
irection$="u")AND posoneX<5
6 newpos1X=posoneX+8
520 IF (direction$="D"OR
direction$="d") AND posoneX
>7 newpos1X=posoneX-8
530 IF (direction$="R"OR
direction$="r") AND posone
X MOD 8<>7 newpos1X=posoneX
+1
540 IF (direction$="L"ORd
irection$="l") AND posoneX
MOD 8<>0 newpos1X=posoneX-
1
550 SOUND1,-15,moveX*5,2
560 IF flagX(newpos1X)=1
SOUND1,1,100,50:PROCdelay:E
NDPROC
570 IF difficultX=1 AND c
olX(newpos1X)=colX(postwoX)
SOUND1,1,100,50:PROCdelay:
ENDPROC
580 VDU5:GCOL0,0:MOVEposoneX
MOD 8*100+220,posoneX D
IV8*100+280:PRINT"*":GCOL0,
7:MOVEposoneX MOD 8*100+220
,posoneX DIV8*100+280:PRINT
;CHR$229:VDU4
590 flagX(newpos1X)=1
600 scoreoneX=scoreoneX+1
610 IFcolX(newpos1X)=colX

```

```

(posoneX) scoreoneX=scoreon
eX+1
620 IFshapeX(newpos1X)=sh
apeX(posoneX) scoreoneX=sco
reoneX+1
630 posoneX=newpos1X
640 GCOL0,7:VDU5:MOVEposoneX
MOD 8*100+220,posoneX D
IV8*100+280:PRINT"*":VDU4
650 PRINTTAB(3,29)" *TA
B(3,29);scoreoneX
660 ENDPROC
670 DEFPROCplayertwo
680 VDU5:GCOL0,15:MOVEpos
twoX MOD 8*100+220,postwoX
DIV8*100+280:PRINT"*"
690 GCOL0,7:MOVEposoneX M
OD 8*100+220,posoneX DIV8*1
00+280:PRINT"*"
700 VDU4
710 COLOUR8:PRINTTAB(13,2
7);name$(2):COLOUR7:PRINTTA
B(1,27);name$(1)
720 PRINTTAB(15,31)" *T
AB(15,31);21-(moveX+2)DIV2T
AB(0,0);
730 *FX15,0
740 direction$=INKEY$(wai
tX)
750 moveX=moveX+1
760 IF(direction$="u" OR
direction$="U")AND postwoX<
56 newpos2X=postwoX+8
770 IF(direction$="d" OR
direction$="D")AND postwoX>
7 newpos2X=postwoX-8
780 IF(direction$="r" OR
direction$="R")AND postwoX
MOD 8<>7 newpos2X=postwoX+1
790 IF(direction$="l" OR
direction$="L")AND postwoX
MOD 8<>0 newpos2X=postwoX-1
800 SOUND1,-15,moveX*5,2
810 IF flagX(newpos2X)=1 S
OUND1,1,100,50:PROCdelay:EN
DPROC
820 IF difficultX=1 AND c
olX(newpos2X)=colX(posoneX)
SOUND1,1,100,50:PROCdelay:E
NDPROC
830 VDU5:GCOL0,0:MOVEpostwoX
MOD 8*100+220,postwoX D
IV8*100+280:PRINT"*":GCOL0,
7:MOVEpostwoX MOD 8*100+220
,postwoX DIV8*100+280:PRINT
;CHR$229:VDU4

```

```

840 flagX(newposX)=1
850 scoretwoX=scoretwoX+1
860 IFshapeX(newposX)=sha
peX(postwoX) scoretwoX=sco
retwoX+1
870 IFcolX(newposX)=colX(
postwoX) scoretwoX=scoretwo
X+1
880 postwoX=newposX
890 GCOL0,7:VDU5:MOVEpostwoX
MOD 8*100+220,postwoX D
IV8*100+280:PRINT"*":VDU4
900 PRINTTAB(15,29)" *TA
B(15,29);scoretwoX
910 ENDPROC
920 DEFPROCsetup
930 VDU23,225,255,255,255
,255,255,255,255,255
940 VDU23,226,24,24,60,60
,126,126,255,255
950 VDU23,227,24,60,126,2
55,255,126,60,24
960 VDU23,228,255,126,60,
24,24,60,126,255
970 VDU23,229,24,24,0,0,0
,0,0,0
980 ENVELOPE1,2,-10,-5,-2
,2,3,4,0,0,0,0,0,0
990 DIMcolX(63),shapeX(63
),flagX(63),name$(2)
1000 ENDPROC
1010 DEFPROCinit
1020 FORcellX=0TO63
1030 colX(cellX)=RND(4):sh
apeX(cellX)=224+RND(4):flag
X(cellX)=0
1040 NEXT
1050 posoneX=0:postwoX=63
1060 flagX(posoneX)=1:flag
X(postwoX)=1
1070 scoreoneX=0:scoretwoX
=0
1080 moveX=0
1090 newposX=0:newpos1X=0
1100 *FX11,0
1110 *FX4,2
1120 *KEY12"L"
1130 *KEY13"R"
1140 *KEY14"D"
1150 *KEY15"U"
1160 ENDPROC
1170 DEFPROCinstruct
1180 VDU19,0,4,0,0,0
1190 VDU23;8202;0;0;0;
1200 VDU28,10,3,30,0
1210 PRINT"THE ATTRIBUTES

```



TRAIL\*\*\*\*\*

```

1220 VDU28,1,24,39,4
1230 PRINTTAB(2,14)"Use a
name of 7 letters or less."
1240 FORNZ=1TO2
1250 PRINTTAB(0,2*NZ^2)"Pl
ayer ";NZ;". Please type in
your name." Then press RE
TURN."
1260 name$(NZ)="
1270 REPEAT
1280 get=GET
1290 IF LEN(name$(NZ))=0 A
ND get>90 get=get-32 ELSE I
F LEN(name$(NZ))=0 GOTO1300
1300 IF get=127 THEN VDU12
7:name$(NZ)=LEFT$(name$(NZ)
,(LEN(name$(NZ))-1)):GOTO12
80
1310 IF(RIGHT$(name$(NZ),1
)="."OR RIGHT$(name$(NZ),1
)=" ") AND get>90 get=get-32
ELSE IF(RIGHT$(name$(NZ),1
)="."OR RIGHT$(name$(NZ),1
)=" ")GOTO1330
1320 IF LEN(name$(NZ))>0 A
ND get>46AND get<97 get=get
+32
1330 PRINTCHR$(get);:name$
(NZ)=name$(NZ)+CHR$(get):UN
TILget=13 OR LEN(name$(NZ))
=8
1340 name$(NZ)=LEFT$(name$
(NZ),LEN(name$(NZ))-1)
1350 NEXT
1360 PROCcont
1370 PRINT;name$(1);" star
ts with a star at the""bot
tom left of the grid."name
$(2);" has a star at the to
p right""of the grid. When
it's your turn,""your nam
e and star will flash."
1380 PRINT"Each player ta
kes a turn to move their""
star one position up, down,
left or""right. This can
be done by entering""the f
irst letter of the word or
the""arrow keys may be use
d instead."
1390 PRINT"The aim of the
game is to score as""many
points as possible by tryi
ng""to move to a new squar

```

```

e with the""same shape and
colour as the square""you
leave."
1400 PROCcont
1410 PRINT"The scores are
as follows:-""3...for mo
ving to a new square which"
""has a symbol of the same
shape""and colour as the o
ne you have left."
1420 PRINT"2...if you man
age to match just the""sha
pe or the colour."
1430 PRINT"1...if you mov
e to a new square""which d
oes not match your last one
""at all."
1440 PROCcont
1450 PRINT"No square on th
e grid may be visited""twi
ce. A marker stays in each
square""visited."
1460 PRINT"If you attempt
an illegal move, you""wil
l hear a wobbly noise and l

```

```

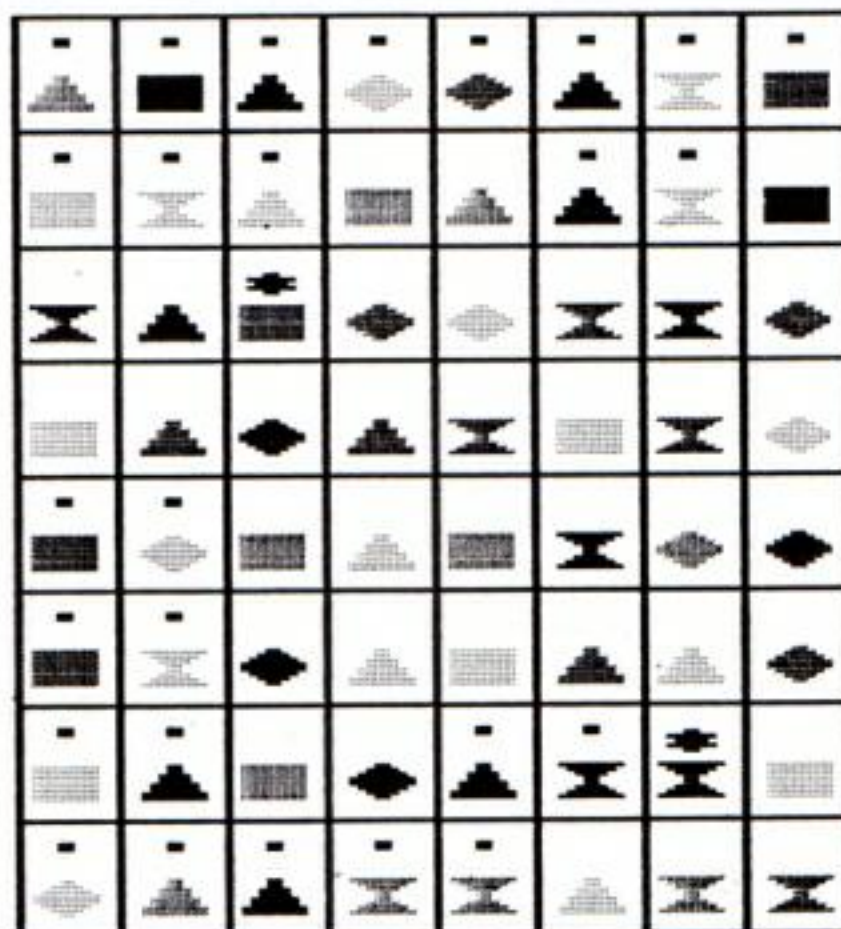
oose""your turn."
1470 PRINT"Each player ha
s twenty moves in""which t
o earn as many points as""
possible."
1480 PRINT"Scores are sho
wn below the grid."
1490 PROCcont
1500 PRINT"You may set th
e time allowed for each""m
ove. Enter the number of se
conds."INPUTwaitX:waitX=wa
itX*100
1510 IF waitX>5000 waitX=5
000
1520 IF waitX<500 PRINT"T
hat would be rather fast. P
lease""enter at least 5 se
conds."PROCdelay:CLS:GOTO1
500
1530 PRINT""You may add t
o the difficulty of the""g
ame by making it illegal to
move""to a square of the
same colour as""your oppon

```

```

ent. Press D if you want""
this option else any other
letter."
1540 *FX202,32
1550 B$=GET$:IFB$="D" diff
icultX=1 ELSEdifficultX=0
1560 PROCcont
1570 ENDPROC
1580 DEFPROCdelay:TIME=0:R
EPEATUNTILTIME>300:ENDPROC
1590 DEFPROCcont
1600 PRINTTAB(1,19)"Press
the space bar to continue."
1610 REPEATUNTILGET=32:CLS
1620 ENDPROC
1630 DEFPROCend
1640 *FX15,0
1650 VDU23;0202;0;0;0;
1660 VDU19,2,4,0,0,0,19,3,
3,0,0,0
1670 PROCcircle(300,600,20
0,3)

```



Bilbo		Thorin	
25	Score	21	
7	Turns	8	



## Attributes Trail listing

### From Page 19

```

1680 PROCcircle(900,600,20
0,3)
1690 PROCcircle(200,650,50
,2)
1700 PROCcircle(400,650,50
,2)
1710 PROCcircle(800,650,50
,2)
1720 PROCcircle(1000,650,5
0,2)
1730 PROCcircle(300,600,40
,1)
1740 PROCcircle(900,600,40
,1)
1750 PROCsmile(300)
1760 IF scoreoneX>scoretwo
X PROCsmile(900) ELSE PROCs
ad
1770 IF scoreoneX>scoretwo
X PRINTTAB(2,22);name$(1)TA
B(2,24)*scoredTAB(2,26);sc
oreoneX ELSE PRINTTAB(2,22)
;name$(2)TAB(2,24)*scoredT
AB(2,26);scoretwoX
1780 IF scoreoneX>scoretwo
X PRINTTAB(12,22);name$(2)T
AB(12,24)*scoredTAB(12,26)
;scoretwoX ELSE PRINTTAB(12
,22);name$(1)TAB(12,24)*sc
redTAB(12,26);scoreoneX
1790 PRINTTAB(3,29)*SPACE
TO PLAY*
1800 REPEATUNTILGET=32
1810 ENDPROC
1820 DEFPROCcircle(X,Y,r
adX,colX)
1830 VDU29,X,Y;
1840 GCOL0,colX
1850 MOVE0,radX
1860 FORangleX=0TO360STEP2
0
1870 upX=SINRAD(angleX)*ra
dX
1880 acrossX=COSRAD(angleX
)*radX
1890 MOVE0,0:PLOT85,upX,ac
rossX
1900 NEXT

```

```

1910 ENDPROC
1920 DEFPROCsmile(X)
1930 VDU29,X;600;
1940 GCOL0,1
1950 radX=150
1960 MOVESINRAD(110)*150,C
OSRAD(110)*150
1970 FORangleX=110TO250STE
P10
1980 upX=SINRAD(angleX)*ra
dX
1990 acrossX=COSRAD(angleX
)*radX
2000 DRAWupX,acrossX
2010 NEXT
2020 ENDPROC
2030 DEFPROCsad
2040 VDU29,900;400;
2050 GCOL0,0
2060 radX=150
2070 MOVESINRAD(300)*150,C
OSRAD(300)*150
2080 FORangleX=300TO420STE
P10
2090 upX=SINRAD(angleX)*ra

```

```

dX
2100 acrossX=COSRAD(angleX
)*radX
2110 DRAWupX,acrossX
2120 NEXT
2130 ENDPROC
2140 MODE6
2150 VDU19,0,4;0;
2160 REPORT:PRINT* at line
";ERL
2170 *FX12
2180 *FX4,0
2190 END
2200 REM downloader
2210 *KEY0 *T.INDX=PAGE-&E
00:FORIX=PAGE TO TOP STEP4:
!(IX-DX)=!IX:NEXT:!(TOP-DX)
=&FF0D:PAGE=&E00:MOLD:MRUN:
M
2220 *FX130,0,120

```

*This listing is included in this month's cassette tape offer. See order form on Page 53.*

DUST OFF YOUR ELECTRON  
AT LAST THE BIG ONE'S HERE



## RICK HANSON

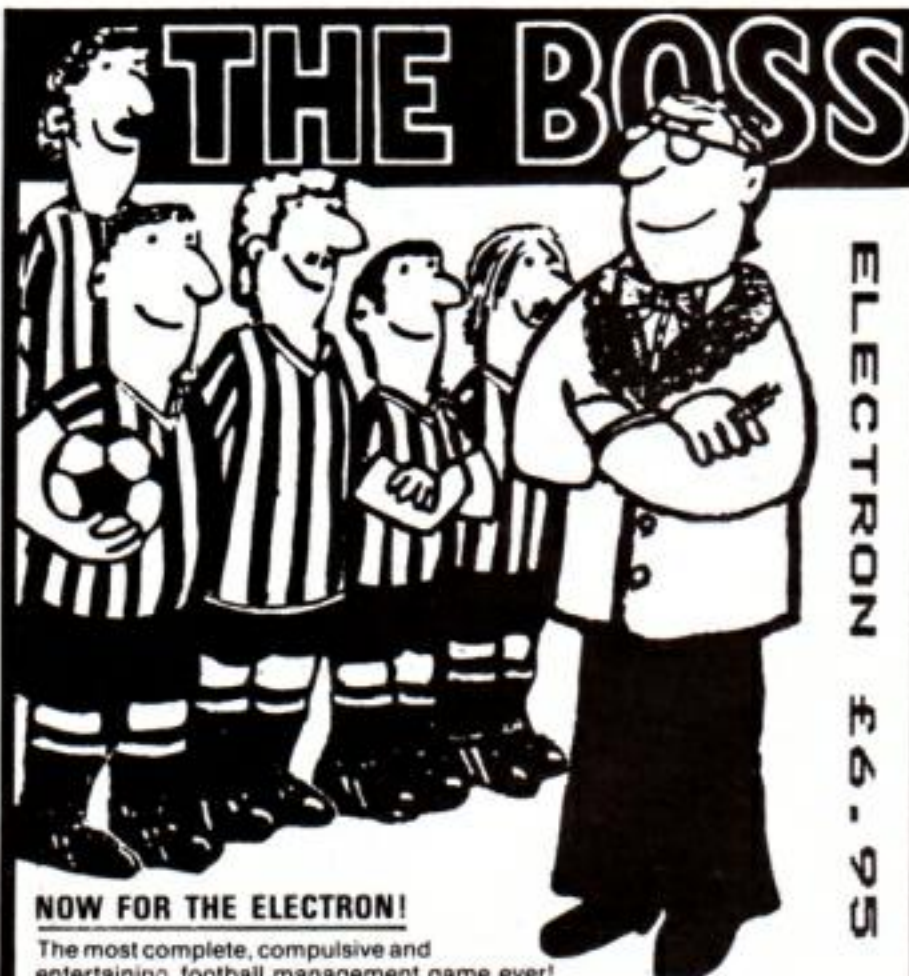
THE THRILLING ADVENTURE OF  
EPIC PROPORTIONS

- ☆ 100% machine code
- ☆ 30K of text
- ☆ 220 locations
- ☆ Full sentence interpreter
- ☆ Adventurer's Note Book
- ☆ Complete Help Service

Cassette £9.95 (state BBC or Electron)  
BBC Disc £11.95 (state 40 or 80 track)

Purchase your copy NOW from:-

**ROBICO SOFTWARE**, 3 Fairland Close,  
Llantrisant, Mid Glamorgan CF7 8QH.  
Tel. (0443) 227354



### NOW FOR THE ELECTRON!

The most complete, compulsive and  
entertaining football management game ever!

- 4 divisions ● FA Cup ● European Cup ● European Cup
- Winners' Cup ● Promotion/Relegation ● Transfers
- Suspensions ● Injuries ● Substitutes ● Name team ● Team selection
- Choose/change team formation ● Weekly league tables ● Reserve squad



**PEAKSOFT**

Check with your retailer, phone your  
Access/Visa number, or just note your name,  
address, computer and game required on the  
back of your cheque or PO.

**48 QUEEN STREET, BALDERTON,  
NEWARK, NOTTS.**  
Tel: 0636 705230

ELECTRON £6.95



SUMMER  
MADNESS

# 21st. Software

NEW SUMMER  
PRICES

PRESENTS A SELECTION OF HARDWARE, UTILITIES & SOFTWARE FOR THE ELECTRON

**VINE MICRO ADDCOM**  
R.R.P. £28.00  
OUR PRICE £26.00

**GILSOFT'S THE QUILL**  
(Adventure's tool for writing adventures)  
CASS. £16.95 OUR PRICE £15.45

**NUTS TO ACORN**  
(SILLY PRICES)

BOXER	£1.99
STARSHIP COMMAND	£2.99
BUSINESS GAMES	£2.99
DESK DIARY	£2.99
SPHYNX ADV.	£2.99
ARCADIANS	£2.99
FREEFALL	£2.99
TREE/KNOWLEDGE	£2.99
SNAPPER	£2.99
HOPPER	£2.99
PERS. MONEY MAN.	£2.99
PHILOSOPHER'S QUEST	£3.99
MUNTERS	£3.99
CRAZY TRACER	£2.99
PLANETOID	£2.99
WORD HUNT	£2.99
ME & MY MICRO CASS & BOOK	£2.50

**PLUS 3 OWNERS DISC**  
**BLUE RIBBONS ELECTRON GAMES**  
Five Games: Nightmare Maze, Castle Assault,  
Diamond Mine, Astro Plumber,  
Diamond Mine II  
R.R.P. £9.95 OUR PRICE 8.95

**SLOGGER ROMBOXES**  
ROMBOX R.R.P. £44.95 OUR PRICE £41.95  
ROMBOX - P  
Built in Centronics Printer Interface + Free  
Printer ROM. R.R.P. £69.95 OUR PRICE £64.95

**TYNESOFT'S**  
**JET SET WILLY**  
R.R.P. £7.95 OUR PRICE £6.50

**SUPERIOR SOFTWARE'S**  
**SMASH PACK**  
3 CASSETTES  
Centibug (Shoot the Centipede)  
Percy Penguin (Crush the Snowbees)  
Zany Kong Jax (Climb the vine leaves - watch  
out for the snappers!)  
Fantastic value  
All 3 for just £7.95!

**The Micropower**  
**POWER PACK!!**  
3 Cassettes:  
**FRENZY** - Trap the nuclear particles  
**THE MINE** Watch out for Dragons whilst  
collecting the money  
**CROAKER** Help Kermit across the road and river  
- save him from becoming frogs legs  
All 3 for £5.95 ONLY!!

**ROBICO'S**  
**PROJECT THESIOS**  
R.R.P. £9.95 OUR PRICE £8.45

**TYNESOFT STARTER PACK ONE**  
4 CASS:  
**BOZO THE BRAVE**  
**CYLON INVASION**  
**TREK II**  
**SPACE CAVERNS**  
R.R.P. £9.95 OUR PRICE £8.95

**FIRST BYTE JOYSTICK INTERFACE**  
Includes conversion tape £19.94  
+ Quickshot II Joystick £12.99  
**TOTAL £32.94 OUR PRICE £27.99**  
**FIRST BYTE INTERFACE ONLY**  
R.R.P. £19.95 OUR PRICE £18.25

**SLOGGER SOFTWARE ROMS**  
**ELKMAN** R.R.P. £17.50 OUR PRICE £15.75  
**STARMON** (machine code monitor)  
R.R.P. £22.50 OUR PRICE £20.25  
**T2P3** Tape to Disc R.R.P. £19.95  
OUR PRICE £18.65  
**STARWORD 16K ROM**  
R.R.P. £34.50 OUR PRICE £31.75  
**STARGRAPH GRAPHICS ROM**  
R.R.P. £21.95 OUR PRICE £19.95  
**TP2CU**  
(Tape to Cumans)  
R.R.P. £19.95 OUR PRICE 18.65

**PLUS 3 DISCS**  
**ACORN'S DATABASE**  
R.R.P. £19.75 OUR PRICE £17.65  
**E.D.S.**  
**STEVE DAVIS SNOOKER**  
R.R.P. £12.95 OUR PRICE £11.65  
**BIRDIE BARRAGE**  
R.R.P. £12.95 OUR PRICE £11.65

**THIS MONTH'S SPECIALS**  
**ENDS 31st JUNE**  
**STAIRWAY TO HELL**  
ONLY £8.95  
**FRANK ONLY £5.90**

	R.R.P.	OUR PRICE
AARDVAK		
Frak	7.90	6.90
Zalaga	7.90	6.90
A.C. PRODUCTS		
Advanced Disc Toolkit Rom	34.50	32.20
ACORN'SOFT		
Elite in Stock	12.95	11.65
Majic Mushrooms	11.95	10.95
Forth	16.85	15.35
Lisp	16.85	8.95
View Rom Cartridge	29.99	17.95
Viewsheet Rom Cartridge	29.99	17.95
Hopper ROM (Cart)	14.95	13.45
Snapper ROM (Cart)	14.95	13.45
ISO Pascal ROM Cart.	59.80	54.80
ACORN'SOFT/BES		
Happy Letters	8.95	7.95
Timeman One	8.95	7.95
Happy Numbers	8.95	7.95
Wordhang	8.95	7.95
Osprey	9.95	8.95
ACORN/LINKWORD		
German	14.95	8.95
French	14.95	8.95
Italian	14.95	8.95
Spanish	14.95	8.95
ADDICTIVE GAMES		
Football Manager	8.95	7.95
Boffin	9.95	7.95
ADVENTURE INT:		
Gremilins	7.95	6.95
The Hulk	7.95	6.95
Secret Mission	7.95	5.95
Mystery Funhouse	7.95	6.95
Voodoo Castle	7.95	5.95
Pyramid of Doom	7.95	5.95
Pirate Adventure	7.95	5.95
ALLIGATA		
Blagga	7.95	6.95
Bumper Bundle	7.95	6.95
Contract Bridge	9.95	8.95
Guardian	7.95	6.95
Tarzan Boy	7.95	6.95
Nightworld	7.95	6.95
ANCO		
Thai Boxing	6.95	5.95
ANIROG		
Jump Jet	9.95	8.95
ATARI'SOFT		
Robotron	9.95	7.95
A.S.K.		
Number Painter	9.95	8.95
Best 4 English	19.95	18.45
Best 4 Maths	19.95	18.45
BLUE RIBBON		
Nightmare Maze		2.50
Castle Assault		2.50
Astro Plumber		2.50
Diamond Mine		2.50
Diamond Mine II		2.50
BUG BYTE		
Twin Kingdom Valley		2.99

	R.R.P.	OUR PRICE
Tennis		2.99
Jack Atac		2.95
Savage Pond		2.95
BRITANNIA		
Play Your Cards Right	7.95	6.95
COMSOFT		
Serpents Lair	4.95	3.95
Playbox	4.95	3.95
S.A.S. Commands	4.95	3.95
C.D.S.		
Steve Davis Snooker	8.95	7.45
Birdie Barrage	7.95	6.95
C.R.L.		
Test Match	7.95	6.95
DR. SOFT		
747 Flight Sim.	7.95	6.95
Phantom Combat	9.95	8.45
D.A.C.C.		
Flight Sim 747 (DACC)	9.95	8.95
Bobby Charlton Soccer	11.95	10.95
DATABASE		
Mini Office	5.95	4.95
Micro Olympics	5.95	4.95
Majic Sword	8.95	7.95
DURELL MARTECH		
Geoff Capes	8.95	7.95
Mineshaft	6.95	5.95
Brian Jacks Superstars	7.95	6.95
Combat Lynx	8.95	7.95
Eddie Kidd Jump	7.95	6.95
Gisborne's Castle	7.95	6.95
ENGLISH SOFTWARE		
Jet Boot Jack	7.95	4.95
Kissin' Cousins	4.95	4.25
ELITE		
Commando	9.95	8.45
EPIC SOFTWARE		
The Wheel of Fortune	8.95	7.45
Castle Frankenstein	6.95	5.95
The Quest of the Holy Grail	6.95	5.95
Kingdom of Klein	6.95	5.95
FIREBIRD		
Star Drifter	3.95	3.45
GOLEM LTD		
Education I	8.00	7.00
Education II	8.00	7.00
Fun with Words	8.00	7.00
Fun with Numbers	8.00	7.00
Jigsaw	8.00	7.00
HEWSON		
Heathrow A.T.C.	7.95	6.95
Southern Belle	7.95	6.50
ICON SOFTWARE		
Frankenstein 2000	6.95	5.95
Caveman Capers	7.95	6.50
IMAGINE		
Yie Ar Kung Fu	8.95	7.95
INCENTIVE		
Confuzion	6.95	5.95
INTERCEPTOR		
Tales Arabian Knights	6.00	5.00

	R.R.P.	OUR PRICE
KANSAS CITY		
Ring of Time	9.50	4.50
Moon Buggy	6.95	4.95
KOSMOS SOFTWARE		
French Mistress A or B	8.95	7.95
German Master A or B	8.95	7.95
Spanish Tutor A or B	8.95	7.95
Answer Back Jun. or Sen.	9.95	8.95
Answer Back Sport	9.95	8.95
Identify Europe	7.95	6.95
L.C.I.		
Micro French	24.50	21.50
Micro Maths (24 progs 'O' Level)	24.50	21.50
Micro English (24 progs 'O' Level)	24.50	21.50
Mega Maths ('A' Level)	24.50	21.50
LONGMAN'S SOFTWARE		
First Moves (Chess 8+)	9.95	8.95
Master Key (Typing Tutor)	9.95	8.95
MACESEN SOFT		
Block Busters	7.95	6.95
Gold Run	9.95	8.95
Bullseye	9.95	7.95
MELBOURNE HOUSE		
Way of Exploding Fist	9.95	8.95
Classic Adventure	6.95	5.95
Hampstead House	6.95	5.95
Terrorolinos	6.95	5.95
M.C. LOTHLORIEN		
Redcats	6.95	5.95
Paras	6.95	5.95
Johnny Reb	6.95	5.95
Special Operations	6.95	5.95
Waterloo	9.95	8.95
Battlezone	6.95	5.95
MICROBYTE		
Er Bert	4.95	3.95
Reversi	4.95	3.95
Pieball	4.95	3.95
MICRODEAL		
Space Shuttle	8.00	5.00
MICROPOWER		
Ghouls	7.95	3.95
Jet Power Jack	6.95	3.95
Positron	6.95	3.95
Swag	6.95	3.95
Gauntlet	6.95	3.95
Chess	7.95	3.95
Killer Gorilla	7.95	3.95
Moonraider	7.95	3.95
U.X.B.	7.95	3.95
Felix/Evil Weevils	6.95	3.95
Felix in Factory	7.95	3.35
Felix/Fruit Monsters	7.95	3.95
Galactic Commander	7.95	3.95
Cyberton	7.95	3.95
Stock Car	6.95	3.95
Which Salt	6.95	3.95
Rubble Trouble	6.95	3.95
Adventure	7.95	3.95
MIRRORSOFT		
Harrier Strike Force	9.95	8.95
Count with Oliver	7.95	6.95
Look Sharp	7.95	6.95

	R.R.P.	OUR PRICE
First Steps	8.95	7.95
Here/There with Mr Men	7.95	6.95
Quick Thinking +	6.95	5.95
Word Games	9.95	8.95
Mastermind	9.95	8.95
Starseeker	9.95	8.95
Crackit Towers	9.95	8.95
OASIS		
Aces High	14.95	12.95
ROBICO SOFTWARE		
Rick Hanson	9.95	8.95
SALAMANDER		
737 Flight Sim	9.95	6.95
SHARDS		
Pettigrews Diary	7.95	6.95
Mystery of Java Star	7.95	6.95
Woodbury End	9.95	8.95
Whoopsy	6.95	5.95
SHIELD		
Maths 'O' Level Examiner	9.95	8.95
Physics 'O' Level Examiner	9.95	8.95
Chemistry 'O' Level Examiner	9.95	8.95
SOFTWARE INVASION		
3D Bomb Alley	7.95	3.95
Gunsplode	7.95	3.95
Blitzkrieg	7.95	3.95
Super Post	7.95	3.95
Vortex	7.95	3.95
Chipbuster	7.95	6.95
Stairway to Hell	17.95	9.95
SLOGGER		
Dogfight (2 player joystick) Key opt.	7.95	3.00
SQUIRREL'SOFT		
Supergolf	7.50	6.50
Trafalgar	8.00	7.00
Polar Perils	7.95	6.95
SUPERIOR SOFTWARE		
Mr Wiz	7.95	6.95
Smash and Grab	7.95	6.95
Overdrive	7.95	6.50
Tempest	9.95	7.95
Repton	9.95	7.95
Death Star	9.95	7.95
Repton 2	9.95	7.95
Citadel	9.95	7.95
Karate Combat	8.95	7.45
TYNESOFT		
Ian Botham Test	7.95	6.50
Rig Attack	4.95	3.95
Supergran (Adv)	7.95	6.95
Winner Games	7.95	6.50
Mousetrap	7.95	6.50
Five-A-Side Secca	4.95	3.95
Peg Leg	4.95	3.95
Bouncing Bombs	4.95	3.95
Wet Zone	4.95	3.95
U.S. GOLD		
Beach Head	8.95	5.95
VISIONS/CSM		
Snooker	8.95	7.95
YES SOFTWARE		
Golf		2.95

BOX OF 10 C20 COMPUTER CASSETTES £4.99 inc VAT & P&P

ALL PRICES ARE INCLUSIVE OF VAT AND CARRIAGE

OVERSEAS ORDERS PLEASE ADD £1.00 THEN 50p FOR 2ND and 3RD ITEMS EACH

We guarantee all titles are originals. We offer a quick and reliable service. Most Electron and BBC titles are available on request with the guarantee of at least £1.00 off the R.R.P.

Please send me:

1. \_\_\_\_\_ £
2. \_\_\_\_\_ £
3. \_\_\_\_\_ £
4. \_\_\_\_\_ £

TOTAL £

Cost

Please make cheques payable to:

21st Software Ltd

Send orders to:

21st SOFTWARE LTD  
15 Bridgefield Avenue  
Wilmslow SK9 2JS  
Tel: Wilmslow (0625) 528885  
Office Hours 9.30am-6pm

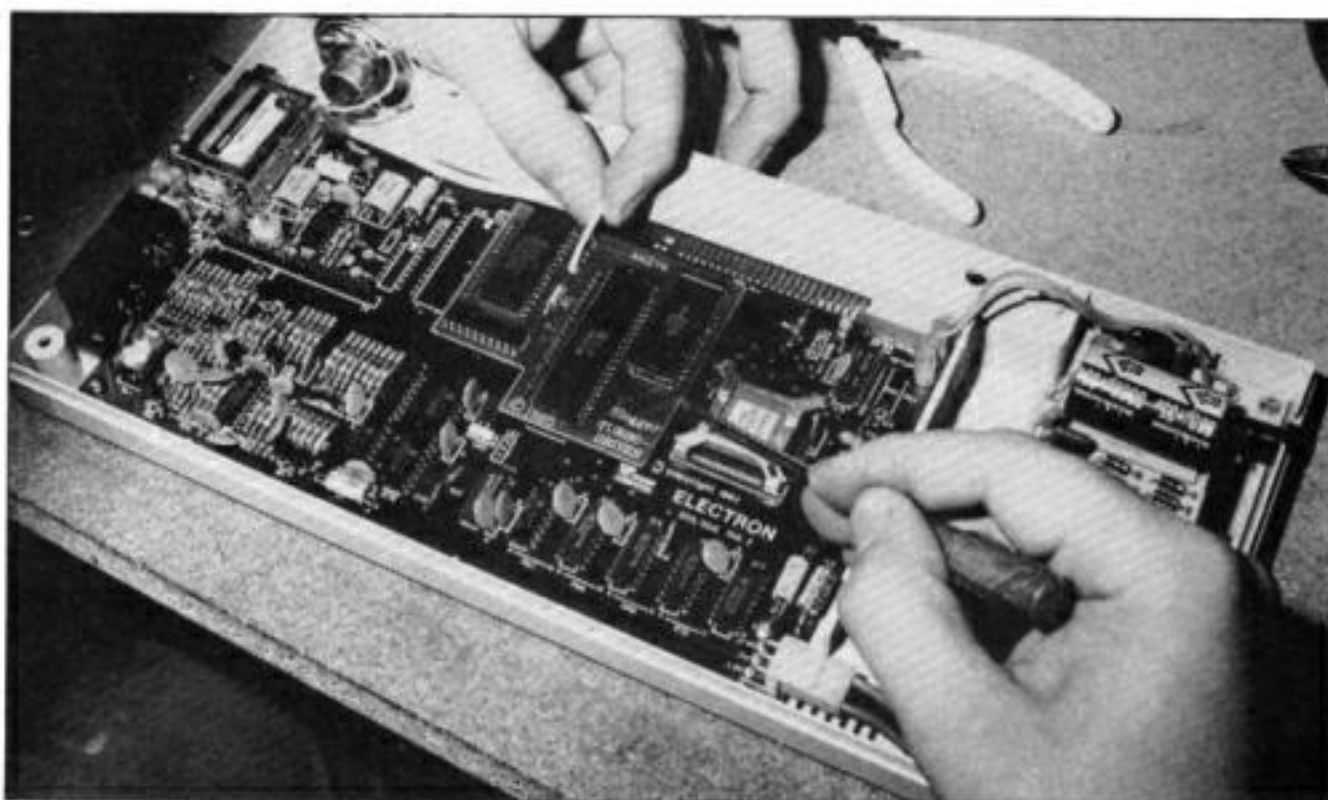
Name .....

Address .....

Post Code .....

Tel. No. ....





Product: Elk Turbo Driver  
Price: £42 (fitted) £29.95 (kit)  
Supplier: Slogger, 107  
Richmond Road, Gillingham, Kent. Tel: 0634  
52303

# Putting Electron into turbo-drive

**THE Electron has acquired an unfortunate reputation as being a slow micro, but this actually isn't so. For instance it's much faster than its competitor, the Sinclair Spectrum.**

This misconception has arisen through living in the shadow of its big brother, the BBC Micro. Any home computer compared with this will seem slower.

This won't placate Electron users though – they want their machine to be every bit as good as the BBC Micro. Now Slogger has come to the rescue and you can give your Electron a big boost in speed with an Elk Turbo-Driver.

The Turbo-Driver is a small board which fits inside the Electron. Apart from a switch on the side of the case

there's no indication that it's there. Flick the switch up and you're in turbo mode, flick it down and you're back to normal.

The board plugs into the 6502 processor and Basic sockets on the main circuit board. It's quite easy to fit to very early Electrons since both chips are simply plugged into their sockets.

Most Electrons however have the chips soldered in and getting them out isn't too easy. Send your machine to Slogger and they will fit the board and return it within seven days – quite an impressive service.

So how good is the Turbo-Driver? In Table 1 you'll see the results of five speed tests when run on a standard

**ROLAND WADDILOVE**  
looks at the exciting potential of Slogger's Elk Turbo-Driver

Electron, Turbo Electron and BBC Micro.

Test 1 is a simple maths program calculating SIN, COS and TAN. The BBC Micro comes out on top as you'd expect, but the Turbo is a very close second with the standard Electron taking half as long again, so there's a significant increase in speed.

Test 2 is the same as Test 1, the only difference being that Test 1 was run in Mode 6 and Test 2 in Mode 1.

The results clearly show a drastic reduction in the performance of the standard Electron. It ran almost three times slower than the BBC Micro and Turbo, which were unaffected by the mode change.

Tests 3 and 4 are again identical, except that Test 3 runs in Mode 6 and Test 4 in Mode 1. An array is dimensioned and filled with a value.

Notice that the BBC Micro is again quickest, with the Turbo close behind, and that there's little difference between Mode 6 and 1. The standard Electron is only slightly slower in Mode 6, but again it's three times slower in Mode 1.

Test 5 is a graphics program running in Mode 2. The BBC Micro easily wins with the Turbo not far behind. The standard Electron is three times slower, as before.

These simple tests clearly show that a BBC Micro is still slightly faster than a Turbo Electron, although you probably won't notice the difference.

The speed increase over a standard Electron varies depending on what it is doing and in which mode it is running. You'll see the biggest difference in Modes 0 to 3,

Test	Standard Electron	Turbo Electron	BBC Micro
1	16.42	11.06	10.05
2	41.49	11.06	10.05
3	11.73	8.23	7.37
4	29.35	9.31	7.38
5	22.85	7.73	4.9

Table 1: Results of the speed tests in seconds



Benchmarks are all well and good, but they don't tell the whole story. What is the Turbo like in normal use? A common question we get asked is: "If I buy the Slogger Turbo will I be able to run all BBC software as long as it doesn't use Mode 7?" The answer to this is definitely no.

All the Turbo does is to speed up the Electron – nothing more, nothing less. If a game doesn't run on a standard Electron it won't run on a Turbo Electron either.

If a BBC game crashes after running for one minute on a standard Electron it will crash after 20 seconds on a Turbo Electron because it's running three times faster.

However, much Electron software is improved and given new life by the boost in speed supplied by the Turbo. It puts extra zip into the cars in Frogger, the aliens are meaner in Space Invaders and the



ghosts in Pac Man seem jet propelled.

Some games are simply too fast now. Alligator's Blagger and Tynesoft's Mousetrap are unplayable. This is why there's a switch on the side of the Electron to set it back to normal speed.

Aardvark's Frak! and one or two other games still run at the same speed and the Turbo makes no difference at all.

Some BBC software does work on the standard Electron, but the games run so slowly they aren't much fun at all. For instance Ghouls of Azzod, Morris Minor and USS Endeavour are three superb games from recent issues of *The Micro User* that all run on the Electron.

However they're so slow I can't imagine anyone wanting to play them. All these games

run at their normal speed on a Turbo Electron and are great fun to play.

So it's fair to say that the Turbo instantly increases the amount of software available for the Electron, though it doesn't turn your Electron into a BBC Micro.

To sum up, the Turbo-Driver increases the speed of the Electron by up to 300 per cent depending on what it is doing. Much Electron software benefits by the increase in speed and the Turbo can be switched off for the rest. BBC Micro software which runs but is unplayable because of its slow speed now runs at the proper speed.

Having used a Turbo Electron I can't bear the thought of going back to my old slow version. This upgrade should have been standard on all Electrons. I'd like to know why Acorn didn't think of this when it was designing the original.

## ELECTRON SOFTWARE BARGAINS from POTTER PROGRAMS 'THE HOTTER PROGRAMS'

Send a S.A.E. for our full list of cut-price software for the Electron, which includes the Big value **Computer Hits 10 and Computer Hits 10 Vol 2** from Beaujolay, as seen on T.V. for our fully inclusive price of only **£8.45** each.

All our games are original and in stock at time of advertising, so order today and avoid delay. Orders outside the UK please add £1.00 per tape. Also available direct from Potter Programs our fiendish adventure games.

### \* NEW RELEASE - THE TWIN ORBS OF AALINOR

One hundred per cent machine code and data compression and interactive characters. Can you recover the lost Orbs of Aalinor and harness their potent power?

NOT AVAILABLE AS PART OF OUR SPECIAL OFFER

Price: £3.95 + 50p p&p

### \* NEW RELEASE - RETURN OF FLINT 32K

The sequel to the very popular SUPER AGENT FLINT. As the Super Agent you have successfully docked your captured rocket with the British Space Station, only to find that it has been infiltrated by the dastardly T.E.R.D. organisation. This is where your mission begins. Price: £2.95

### THE STAFF OF LAW 32K

Can you track down the Staff of Law and master its potent Earth Power to defeat the Despiser? "Extremely fiendish ... well worth buying" Electron User. Price: £2.95

### SUPER AGENT FLINT 32K

The dreaded T.E.R.D. (Terrorist for England's Ruin and Destruction) organisation has reared its ugly head. Only you as Super Agent Flint can capture their interstellar rocket and secret plans. "Quite fast and fun to play ... at the price I must recommend it" Electron User Price: £2.95

### GALADRIEL IN DISTRESS 32K

The Princess Galadriel has been abducted and an evil spell holds her prisoner. You must seek aid from the Wise Lore Master to release her and save yourself from the wrath of King Theoden. Price: £2.95

All adventures with full save game facility for the Electron or BBC B. Price £2.95 each OR SPECIAL OFFER: Any three games for £5.95 OR ALL FOUR games for only £7.95. Please add 50p P&P per order (£1.00 for orders outside UK). Also hint sheets available 20p each game.

Send cheque or P.O. with your order to:

Dept E14, Potter Programs, 7 Warren Close, Sandhurst, Camberley, Surrey GU17 8JR. Tel: 0252 877608.

## DOUBLE PHANTOM?

YES! This IS the program demonstrated on BBC TV's "Micro Live". The Worlds first micro multi-user combat flight simulation is now available direct from DOCTOR SOFT via our 'HOT LINE' FIRST CLASS MAIL ORDER service.

DOUBLE PHANTOM is basically a TWO computer version of the highly acclaimed PHANTOM COMBAT simulation. At least one BBC must have a disc system. A hardware link (included) then links the machines which become separate aircraft sharing the same airspace, each VISIBLE and VULNERABLE to the other!

DOUBLE PHANTOM has all the usual PHANTOM features including the fastest and smoothest 3D colour graphics around (15fps). RAF Phantom pilot Paul Courtnage's verdict: "Marvellous ... quite the best micro flight simulation I've ever seen ... Totally captivating!"

Phone: Mail Order Hot line 0903 776000 with VISA/ACCESS. Mail: PO BOX 66, East Preston, West Sussex BN16 2TX. Most orders despatched SAME DAY, FIRST CLASS, POST FREE.

DOUBLE PHANTOM (inc link)	BBC ★	disc 19.95
LINK separately	BBC	cass 9.95
PHANTOM COMBAT	BBC ★	disc 12.95
PHANTOM COMBAT	Electron & BBC	cass 9.95
747	BBC B only	disc 9.95
747	BBC B only	cass 8.95
747	Electron	cass 7.95
747	Commodore 64	cass 12.95
747	Commodore 64	disc 14.95
747	Commodore 64(USA format)	disc 14.95

(Overseas orders, equiv currency, add air mail at cost)

JOYSTICKS optional with all programs

BBC means all machines from 32k up

★ SPECIFY DFS when ordering discs

£2 discount on multiple order

**DOCTOR SOFT - THE FLIGHT SIMULATION SPECIALIST**





# SLOGGER

PLEASE NOTE THIS LABEL IS  
FOR SENDING TDI ORDERS  
ONLY!

Parcel Post  
Amount of  
postage to be  
paid by  
licensee

Date stamp

Postage Forward Parcel Service  
Licence no. GJC1

No postage stamp  
necessary  
unless posted in  
Channel Islands  
Isle of Man or  
Republic of Ireland

**SLOGGER LTD**  
**107 RICHMOND ROAD**  
**GILLINGHAM**  
**KENT**  
**ME7 1BR**

**P**

## THE ELK TURBO-DRIVER

(DESIGNED BY ANDYK LTD)

INCREASES THE SPEED OF YOUR  
ELECTRON COMPARABLE TO THE BBC

★★ UP TO 100% IMPROVEMENT IN SPEED ★★  
★★ ABLE TO RUN BBC SOFTWARE (Non Mode 7)  
WHERE SPEED WAS THE LIMITING FACTOR ★★  
(Such as Acornsoft's Aviator Flight Simulator)

★★ MAKES ELECTRON SOFTWARE RUN FASTER ★★

CAN BE SWITCHED BETWEEN NORMAL AND "TURBO-DRIVE"

★★ OPERATES IN ALL ELECTRON MODES ★★

★★ NO SOFTWARE MODIFICATION REQUIRED ★★

★★ COMPATIBLE WITH ALL ADD-ONS

Plus 1, Plus 3, Rombox, Adaptor Boards, etc) ★★

Your upgraded Electron will be returned within 7 days of receipt by SLOGGER

All Inclusive ONLY **£42.00** (VAT included)

Fitted, Tested, Including switch, carriage paid both ways

PLEASE QUOTE T-D1 ON ORDER FORM

The Upgrade "TURBO-DRIVER" Kit available

(including switch)

PLEASE QUOTE ON FORM T-D2 **£29.95** Incl. P&P

### Slogger's unique guarantee!!!

The guaranteed seven day installation service

SLOGGER is providing a unique service with guarantees  
to return your Electron with the "TURBO-DRIVER"  
installed **WITHIN SEVEN DAYS OF ITS RECEIPT!!!**

Simply enclose your order with your Electron (in its  
original packing if possible) and send using the "Free  
post" address label opposite.



#### RS423 SERIAL PORT

Has Drive capability and Software Interface as on the  
BBC Model "B". Plugs directly into Plus 1 Cartridge slot.  
**ONLY £39.99**

#### PLUS 1 ROM UPGRADE

Replacement 8K Eprom to allow loading of cassette  
Software in High resolution Modes. Allows Basic to be  
called instead of being forced into another language on  
Switch On or CTRL-BREAK.  
**ONLY £7.95**

#### T2P3

Transfer the majority of cassettes Tape to Plus 3 disk  
system, for much faster loading.  
**ONLY £19.95**

#### T2CU

Transfers the majority of cassettes Tape to Cumana Disk  
system for much faster loading.  
**ONLY £19.95**

#### STARGRAPH

Graphics Rom giving screen dump to EPSON printer,  
printing of text at any angle or any size, circle, ellipse  
polygons, arc, dotted lines, colour filling plus more.  
**ONLY £21.95**

#### PRINTER ROM

Allows use of sideways RAM as 8K or 16K print buffer  
and offers a host of useful utilities for EPSON printers.  
Ideal for all your printing requirements.  
★ Electron/BBC compatible.  
**ONLY £24.95**

#### EPROM CARTRIDGE

Able to take application Software as well as Utility ROMs.  
Plugs into PLUS 1 and allows use of either one or two  
ROMs.  
**ONLY £14.00**

#### \*TREK

A ROM disassembler with a difference. Ideal for beginners  
not only to Machine Code but to the Electron itself as this  
ROM Utility actually COMMENTS as it disassembles, a  
feature found in no other package.  
**SPECIAL INTRODUCTORY PRICE £17.50**

8K Static RAM Chip **£4.25**  
16K Eprom **£4.00**  
8K Eprom **£3.50**

#### STARMON

★ Display of memory in: ASCII and binary, decimal, octal  
or hexadecimal.  
★ Full support of sideways ROMs.  
★ Comprehensive debugging facilities, including  
breakpoints, traces and events.  
★ "a very professional piece of firmware" ... Acorn User.  
**ONLY £22.50**

#### ELKMAN

The most powerful ROM  
manager on the BBC is  
now available for the  
Electron.  
**ONLY £17.50**

#### 16K SIDeways RAM FOR ROMBOX

★ Fully compatible with Plus  
1, Plus 3, etc.  
★ No soldering.  
★ Complete with RAMs.  
★ Write protect option.  
**£29.95**



# New ELECTRON New THE ROMBOX PLUS

**A direct replacement for the Acorn Plus I**

- ★ Two Cartridge slots
- ★ Four ROM Sockets
- ★ Centronics Printer Interface
- ★ Joystick Interface available for the Cartridge slot. (Separate price)

**Available at the Acorn User Show at the Barbican Centre  
– 24th to 27th July on Stand No. 38**

## STARWORD (16K ROM)

A Professional word Processor for UNDER £35  
★ Does everything VIEW does plus MUCH MORE!  
Designed for the home user, education or small business needs, STARWORD enables even those with limited typing skills to produce and print letters, manuals or reports using the Electron.

- ★ 40 and 80 column screen modes.
- ★ 132 column text width max.
- ★ Variable margins and tabs.
- ★ Formatting and justification.
- ★ Very extensive printer control facilities.
- ★ Very large documents, letters no problem.
- ★ Search, Find, replace.
- ★ Move, Copy, Insert.
- ★ Extensive single key editing.
- ★ Proper Mailmerge with STARSTORE & STARSTORE II.
- ★ Text spooling.
- ★ Headers, Footers, Page numbers.
- ★ Text remains through BREAK.
- ★ Printer driver for non-EPSON printers.
- ★ Very easy to use.
- ★ 120 page well written manual.

"It is certainly the most powerful currently available for the Electron". ELECTRON USER April '86.

**ONLY £34.50**

## STARWORD for CUMANA DISK INTERFACE

Enhanced version of Starword using the Cumana clock to allow Day, Date and Time stamping when printing.  
A feature available on only the best Word Processors!

**ONLY £34.50**

## PRINTER DRIVER for STARWORD

Use most printers with STARWORD.

**ROM £9.95**

**VINE MICRO ADDCOMM £28.00**

## STARSTORE (ON ROM)

Store and retrieve your names and addresses or any other information with the STARSTORE DATABASE, written specially for the Electron, STARSTORE works with STARWORD for personalising standard letters (mailmerging).

**ONLY £21.95**

## STARSTORE II

- ★ New improved more powerful Database for Disk Users.
- ★ Maximum of 90 Fields.
- ★ Maximum 16 character Field name.
- ★ 254 characters per field.
- ★ Maximum records limited to size of Disk.
- ★ Formatted printing to allow fields at specific point.

**ONLY £29.95**

## CUMANA DISK STARTER PACK

- ★ 40T Single Sided Double Density BBC Drive
- ★ Interface slots simply into Plus I or ROMBOX Plus Cartridges
- ★ Uses no RAM
- ★ Additional Sideways ROM Socket
- ★ Real Time Clock & Calendar with battery and backup.

Price **£169.95** with carriage etc.

*All prices include VAT P&P UK Mainland only*

**SEND  
FOR  
THEM  
TODAY**

Cheques payable to:  
**SLOGGER LTD.**

Expiry Date

PLEASE SUPPLY

Cost

☐ Access No. ....

1 \_\_\_\_\_ £ \_\_\_\_\_

☐ Visa .....

2 \_\_\_\_\_ £ \_\_\_\_\_

Name .....

3 \_\_\_\_\_ £ \_\_\_\_\_

Address .....

4 \_\_\_\_\_ £ \_\_\_\_\_

5 \_\_\_\_\_ £ \_\_\_\_\_

Signed ..... Tel. No: .....

**Total £**

Send Orders to: **SLOGGER LTD.**  
107 RICHMOND ROAD, GILLINGHAM, KENT

**DEALER ENQUIRIES WELCOME. TEL: 0634 52303 (2 lines)**



NOW that we've got the hang of creating and using our own Basic keywords, let's round off this series by implementing the powerful WHILE . . . WEND facility that BBC Basic lacks.

You will probably be familiar with FOR . . . NEXT and REPEAT . . . UNTIL loop structures, having used them several times in most of your programs.

But have you ever felt that neither FOR . . . NEXT nor REPEAT . . . UNTIL were quite what you wanted for a particular piece of code?

Sometimes you need a little extra. To see why, let's have a quick look at these two structures.

FOR . . . NEXT is a loop that will execute a fixed number of times. For example, the following program will loop exactly 100 times:

```
10 FOR X=1 TO 100
20 PRINT X
30 NEXT X
40 END
```

This is all very well unless you want to be able to break out of the loop for any reason. Perhaps you want the user to have the option of pressing the spacebar to stop. You could allow for this in the following way but it is sloppy programming:

```
10 FOR X=1 TO 100
20 PRINT X
30 IF INKEY$(0)=" "
THEN X=100
40 NEXT X
50 END
```

Obviously the way we get round this on the BBC Micro is to use a REPEAT . . . UNTIL loop, as in the following:

```
10 X=0
20 REPEAT X=X+1
30 PRINT X
40 UNTIL X=100 OR
INKEY$(0)=" "
50 END
```

Yet there is still a limitation here. Supposing you hold

the spacebar down right from the start of program execution. No matter what we do X will still reach a value of 1 which will be printed out.

Admittedly you would have to have fast reflexes to hit the spacebar immediately after running the program, but this is only an example. Anyway, how could we stop this happening?

This is where WHILE . . . WEND comes into its own. Have a look at this program:

```
10 X=0
20 WHILE X<100 AND
INKEY$(0)<>" "
30 X=X+1
40 PRINT X
50 WEND
60 END
```

The difference between this and a REPEAT . . . UNTIL loop is that the condition is checked before the instructions inside the loop are executed rather than after.

So if the condition after the WHILE in line 20 is true the instructions inside the loop will be executed, and if the condition is false program execution will jump to the next WEND.

In many cases you want a number of things to happen when a certain condition is true. In Fortran you would use

IF and END IF. This is similar to Basic's IF, except that if the condition following the IF is true all instructions following it are executed until an END IF is encountered.

So you can see that WHILE . . . WEND can be used as a multi-line IF, for example:

```
10 X=0
20 Y=100
30 Z=1000
40 WHILE X<100 AND Y>50
AND Z<1200
50 X=X+1
60 Y=Y-1
70 Z=Z+2
80 PRINT X,Y,Z
90 WEND
100 END
```

Lines 50-80 could have been made into a multi-statement line, but I think it is easier to follow a program which has as few multi-statement lines as possible.

You might argue that you could use the following structure putting the statements to be executed in PROCb, as below:

IF a THEN PROCb

You would be right, but then, that would be your personal choice. If I were debugging a program with a large number of procedures in it I would have to keep going

backwards and forwards to follow the flow of the program. Using WHILE . . . WEND the program flow is kept up.

I am not saying that you could or should replace all procedures with WHILE . . . WEND as, for example, you would not have local variables or be able to pass parameters.

But careful use of WHILE . . . WEND can make programs easier to write and to follow. The actual decision whether to call a separate procedure or simply code through is more a matter of art than science.

To use WHILE . . . WEND in your programs type in the listing of that name and then save it. When you run it it assembles the object code at &B00 which is then saved to tape or disc as a file called WW. To use this in future type:

\*RUN WW

By the way, with this utility you can't have nested WHILE . . . WEND loops. But to make up for this if you use WHILE . . . WEND in a program and press Escape you can go back to the last WHILE statement by simply typing WEND.

Thus you have the added bonus of something similar to CONT (or continue) which the BBC Micro does not have.

Now to how it works. Lines 100 to 1490 will be familiar from my last article. They trap the Break (BRK) vector and check whether one of our new keywords has caused the error.

Lines 1530 to 1590 contain the new keyword table



which holds the keywords and action addresses of WHILE and WEND.

Lines 1630 to 1810 store the present position of PTR to when a WHILE is encountered. This is to enable us to continue execution at this position at a later point.

Lines 1850 to 1960 use a ROM routine—the one used by EVAL—to test the condition

following the WHILE.

If it is true execution jumps to true.

If the condition is not true lines 2000 to 2130 look for a matching WEND.

When it has been found, the location following it is stored so that program execution is made to continue from there.

If the condition following the WHILE was true lines

2170 to 2230 set PTR to the start of the lines between the WHILE and WEND, which must now be interpreted.

Thereafter whenever a WEND is encountered lines 2270 to 2430 force execution to jump to the condition following the last WHILE and evaluate it—we've already stored this in lines 1630 to 1810. Thus the process con-

tinues, jumping back to test the conditions following each WHILE whenever a WEND is found, until finally that condition is not true, when we drop out of the loop.

This is the last in the present series. I hope you have found it useful and look forward to seeing any extra keywords and routines you come up with.

100 REM *****	540 \	980 \	1420 ADC #1
110 REM *	550 .main	990 .comloop	1430 STA &82
120 REM * WHILE..WEND *	560 \	1000 \	1440 LDA &83
130 REM *	570 PHP	1010 LDY #0	1450 ADC #0
140 REM * By Robin *	580 PHA	1020 \	1460 STA &83
150 REM * Nixon *	590 TYA	1030 .comloop1	1470 LDY #0
160 REM *	600 PHA	1040 \	1480 LDA (&82),Y
170 REM * (c) Electron *	610 TXA	1050 LDA (&82),Y	1490 RTS
180 REM * User *	620 PHA	1060 BEQ found	1500 \
190 REM *	630 LDY #0	1070 CMP #58	1510 .keytable
200 REM *****	640 LDA (&FD),Y	1080 BEQ notcommand	1520 \
210 REM	650 CMP #4	1090 CMP (&80),Y	1530 EQU "WHILE"
220 MODE 6	660 BEQ checkcommand	1100 BNE next	1540 EQU 0
230 oswrch=&FFEE	670 \	1110 INY	1550 EQU while
240 osbyte=&FFF4	680 .notcommand	1120 JMP comloop1	1560 EQU "WEND"
250 checkend=&9857	690 \	1130 \	1570 EQU 0
260 continue=&8B9B	700 PLA	1140 .next	1580 EQU wend
270 evalexpr=&9B29	710 TAX	1150 \	1590 EQU 58
280 FOR PASS=0 TO 3 STEP3	720 PLA	1160 JSR incmatch	1600 \
290 PZ=&B00	730 TAY	1170 BNE next	1610 .while
300 [	740 PLA	1180 JSR incmatch	1620 \
310 OPT PASS	750 PLP	1190 JSR incmatch	1630 LDX #1
320 \	760 JMP (&70)	1200 JSR incmatch	1640 STX &86
330 .start	770 \	1210 JMP comloop	1650 DEX
340 \	780 .checkcommand	1220 \	1660 \
350 LDA &282	790 \	1230 .found	1670 .incwhile
360 LDX &283	800 LDA &A	1240 \	1680 \
370 CMP #main MOD &100	810 CLC	1250 STY &86	1690 JSR get
380 BNE changebrkvector	820 ADC &B	1260 INY	1700 INX
390 CPX #main DIV &100	830 STA &80	1270 LDA (&82),Y	1710 CPX #4
400 BEQ alreadychanged	840 LDA &C	1280 STA &84	1720 BNE incwhile
410 \	850 ADC #0	1290 INY	1730 LDA &A
420 .changebrkvector	860 STA &81	1300 LDA (&82),Y	1740 STA &1B
430 \	870 SEC	1310 STA &85	1750 STA &8D
440 STA &78	880 LDA &80	1320 LDA #(quit-1) DIV&100	1760 LDA &B
450 STX &71	890 SBC #1	1330 PHA	1770 STA &19
460 LDA #main MOD &100	900 STA &80	1340 LDA #(quit-1) MOD&100	1780 STA &8E
470 STA &282	910 LDA &81	1350 PHA	1790 LDA &C
480 LDA #main DIV &100	920 SBC #0	1360 JMP (&84)	1800 STA &1A
490 STA &283	930 STA &81	1370 \	1810 STA &8F
500 \	940 LDA #keytable MOD&100	1380 .incmatch	1820 \
510 .alreadychanged	950 STA &82	1390 \	1830 .while1
520 \	960 LDA #keytable DIV&100	1400 LDA &82	
530 RTS	970 STA &83	1410 CLC	



## Extra Commands listing

### From Page 27

1840 \	2080 BNE findwend	2340 INX	2600 DEC &B6
1850 JSR evalexpr	2090 JSR get	2350 CPX #3	2610 LDA &B6
1860 LDA &2A	2100 CMP #ASC*D*	2360 BNE incwend	2620 CLC
1870 BNE true	2110 BNE findwend	2370 LDA &B0	2630 ADC &A
1880 LDA &1B	2120 INC &A	2380 STA &1B	2640 STA &A
1890 CLC	2130 RTS	2390 LDA &B0E	2650 JSR checkend
1900 ADC &19	2140 \	2400 STA &19	2660 PLA
1910 STA &B	2150 .true	2410 LDA &B0F	2670 PLA
1920 LDA &1A	2160 \	2420 STA &1A	2680 PLA
1930 ADC #0	2170 LDA &1B	2430 JMP while1	2690 PLA
1940 STA &C	2180 STA &A	2440 \	2700 PLA
1950 LDA #0	2190 LDA &19	2450 .get	2710 PLA
1960 STA &A	2200 STA &B	2460 \	2720 PLA
1970 \	2210 LDA &1A	2470 LDA &B	2730 PLA
1980 .findwend	2220 STA &C	2480 CLC	2740 PLA
1990 \	2230 RTS	2490 ADC #1	2750 JMP continue
2000 JSR get	2240 \	2500 STA &B	2760 }
2010 CMP #ASC*W*	2250 .wend	2510 LDA &C	2770 NEXT
2020 BNE findwend	2260 \	2520 ADC #0	2780 OSCLI (*SAVE WM *+ST
2030 JSR get	2270 LDX #1	2530 STA &C	R\$*start+* *+STR\$*PZ)
2040 CMP #ASC*E*	2280 STX &B6	2540 LDY #0	
2050 BNE findwend	2290 DEX	2550 LDA (&B),Y	
2060 JSR get	2300 \	2560 RTS	
2070 CMP #ASC*N*	2310 .incwend	2570 \	
	2320 \	2580 .quit	
	2330 JSR get	2590 \	

*This listing is included in this month's cassette tape offer. See order form on Page 53.*

## C & F ASSOCIATES

### BARGAIN PRICE ELECTRON SOFTWARE

Title	RRP	Our PRICE	Title	RRP	Our PRICE	Title	RRP	Our PRICE
Commando .....	9.95	7.50	Football Manager .....	8.95	6.95	Thai Boxing .....	5.95	4.95
Citadel .....	9.95	7.50	Southern Belle .....	7.95	6.50	Bug Eyes 2 .....	7.95	6.50
Exploding Fist .....	9.95	7.50	Frak .....	7.90	6.50	Questprobe .....	7.95	6.50
Yie Ar Kung Fu .....	8.95	6.95	Caveman Capers .....	7.95	6.50	Micro Olympics .....	5.95	4.95
10 Computer Hits 2 .....	9.95	7.50	Ian Botham Test .....	7.95	6.50	Mineshaft .....	6.95	5.95
Jet Set Willy .....	7.95	6.50	Steve Davis Snooker .....	8.95	6.95	Zalaga .....	6.95	5.95
Mouse Trap .....	7.95	6.50	Boffin .....	9.95	7.25	Star Drifter .....	3.95	3.75
Rick Hanson .....	9.95	7.95	Combat Lynx .....	8.95	6.75	Twin Kingdom Valley .....	2.95	
Project Thesius .....	9.95	7.95	Blockbusters .....	7.95	6.50	Golf .....	2.95	
Repton .....	9.95	7.50	Blockbuster Gold Run .....	9.95	7.50	Ghouls .....	2.95	
Repton 2 .....	9.95	7.50	Treasure Hunt .....	9.95	7.50	Escape Moonbase Alpha .....	2.95	
Phantom Combat .....	9.95	7.50	Bullseye .....	8.95	6.95	Jet Power Jack .....	2.95	
Strike Force Harrier .....	9.95	7.50	Crack It Towers .....	9.95	7.50	Croaker .....	2.95	
Winter Olympics .....	7.95	6.50	Wheel of Fortune .....	8.95	6.95	Cybertron Mission .....	2.95	
Beach Head .....	8.95	6.95	Quest/Holy Grail .....	6.95	5.95	Electron Invaders .....	2.95	
Jump Jet .....	9.95	7.50	Castle Frankenstein .....	6.95	5.95	Danger UXB .....	2.95	
Tempest .....	9.95	7.50	Kingdom of Klein .....	6.95	5.95	Rubble Trouble .....	2.95	
Karate Combat .....	8.95	6.95	Aces High .....	9.95	7.50	Gauntlet .....	2.95	
Drain Mania .....	7.95	6.50	Robin of Sherwood .....	7.95	6.50	Bandits at 3 O'Clock .....	2.95	
The Quill .....	16.95	14.95	Flight Path 737 .....	5.95	4.95	Killer Gorilla .....	2.95	
Death Star .....	9.95	7.50	Dynabyte Collection .....	7.99	6.50	Stock Car .....	2.95	
Eddie Kidd .....	7.95	6.50	Chess .....	7.95	6.50	Galactic Commander .....	2.95	
Brian Jacks .....	7.95	6.50	Chip Buster .....	7.95	5.95	Castle Assault .....	2.25	
Geoff Capes .....	8.95	6.95	Overdrive .....	7.95	6.50	Astro Plumber .....	2.25	
Stairway to Hell .....	12.95	10.95	Webwar .....	4.95	4.50	Diamond Mine 2 .....	2.25	
						Arabian Nights .....	1.99	

Orders normally despatched by First Class Post on day of receipt. But allow max. of seven days. All prices include VAT and P&P (Overseas orders add £1)

Name .....	Title .....	Cost .....
Address .....	.....	.....
.....	.....	.....
Make of computer .....	Total .....	.....

Make PO/Cheques payable to:  
**C & F ASSOCIATES**  
 and send to:  
**C & F ASSOCIATES**  
**PO BOX 2**  
**BIDEFORD EX39 3RE.**  
**Tel: (023 73) 619**



**SNAP Dragon**, a card game based on that old favourite Snap, is full of fun and excitement for youngsters.

The cards are placed one by one on the table. When the top two cards match hit your key before your opponent can press his.

If you beat him the door to your pet dragon's cave is raised a little. If you're not quick enough your opponent gains the advantage instead.

After winning several times the door will be high enough for one of the dragons to emerge. He'll race out and destroy the opposing player.

Are your reactions fast enough to avoid the fiery fate that awaits you?

The keys are Z for player 1 and / for player 2.

The program is fairly long for a Mode 1 game, so leave out all unnecessary spaces when entering the listing or you'll run out of memory. The space following the line number isn't needed so miss it out.



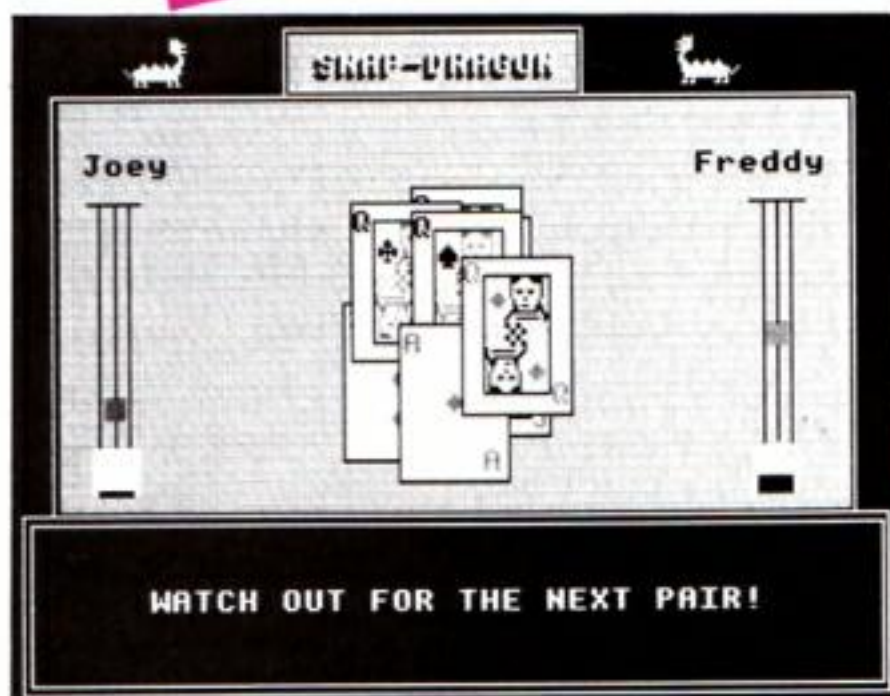
### MAIN VARIABLES

X1%,Y1%	Player 1's lift coordinates.
X2%,Y2%	Player 2's lift coordinates.
X%,Y%	Graphics window coordinates for card background, colour.
GC	Court card colours.
C	Card value.
SUIT	Card suit.
da%	Card counter.
D1%,D2%	Dragon's cave coordinates.

By **PHILIP ORD** and  
**KEITH OWENS**

### PROCEDURES

setup	Inputs players' names and sets up screen.
chars	Defines characters and deletes flashing cursor.
init	Sets initial values for all variables used.
select_card	Uses information from PROCdata to select card and suit. Also defines correct colours.
shuffle	Shuffles the deck after every 52 cards.
key	Tests for keypress and acts accordingly.
snap1	If keypress is valid, moves lift of player 1 and enlarges left hand cave entrance.
snap2	Moves lift of player 2 and enlarges right hand cave entrance.
invalid	If cards do not match when key is pressed a warning message is printed.
display	Creates random colour and sound display.
win	Congratulates winner and offers a new game.
data	Generates a random number between 1 and 52 inclusive to produce from the data statements, a different card and suit value.



**Full listing starts  
on Page 30**



## From Page 29

```

10 REM Snap Dragon
20 REM By P.Ord/K.Owens
30 REM (c) Electron User
40 IF PAGE>=E00 GOTO1410
50 DIM NX(52),C(52),SUIT
(52):=FX16
60 MODE1:VDU23,1,0;0;0;0
;VDU7:PRINTTAB(10,16)*INST
RUCTIONS Y or N?:M$=GET$:I
F M$<>"Y" AND M$<>"N" GOTO6
0
70 CLS:IF M$="Y"PROCinst
:CLS:VDU20
80 ZX=0:PROCdragon:VDU5:
MOVE160,852:VDU224,225,226,
8,11,227:MOVE960,852:VDU11,
228,8,10,229,230,231
90 PROCchars:N=0
100 PROCinit:PROCdata:PRO
Cset_up:GOTO230
110 DEF PROCset_up
120 MOVE54,256:DRAW54,810
:DRAW1223,810:DRAW1223,256:
DRAW54,256:MOVE10,22:DRAW10
,256:DRAW1270,256:DRAW1270,
22:DRAW10,22:MOVE20,32:DRAW
20,246:DRAW1260,246:DRAW126
0,32:DRAW20,32:MOVE395,812:
DRAW395,898:DRAW826,898:DRA
W826,812
130 VDU19,2,2;0;:VDU24,40
0;817;816;888;:BCOL0,130:CL
6
140 X=432:Y=856:FOR I=1 T
O 10:X=X+1:Y=Y+1:MOVEX,Y:GC
OL0,0:PRINT"SNAP-DRAGON":NE
XT:MOVEX,Y:GCOL0,3:PRINT"SN
AP-DRAGON"
150 VDU4:VDU20,1,29,38,25
:COLOUR128:CLS:VDU5:VDU24,6
4;264;1213;800;:BCOL0,130:C
L6
160 IF N=0 MOVE96,600:CL6
:VDU7:INPUT"WHAT IS YOUR NA
ME PLAYER 1"N1$:MOVE96,500:
VDU7:INPUT"WHAT IS YOUR NAM
E PLAYER 2"N2$:CL6
170 BCOL0,0:MOVE166,350:D
RAW166,670:MOVE123,350:DRAW
123,670:MOVE1088,350:DRAW10
88,670:MOVE1131,350:DRAW113
1,670:MOVE105,670:DRAW103,6
70:MOVE1070,670:DRAW1148,67
0
180 MOVE144,670:DRAW144,3
82:MOVE1109,670:DRAW1109,38

```

```

2:MOVEX1X,Y1X:VDU10,0,1,228
:MOVEX2X,Y2X:VDU228
190 AX=1181-(LEN(N2$)*32)
200 BCOL0,0:MOVE96,735:PR
INT;N1$:MOVEAX,735:PRINT;N2
$
210 VDU24,115;286;179;346
;:BCOL0,131:CL6:VDU24,1075;
286;1139;346;:CL6
220 ENDPROC
230 VDU4:CLS:VDU7:PRINTTA
B(1,2)*PRESS THE SPACEBAR T
O START THE DEAL*:REPEAT UN
TIL GET=32:CLS
240 PROCprint:PROCselect_
card:PROCcard:PROCkey:GOTO2
40
250 DEFPROCchars
260 VDU23,224,54,127,127,
127,62,28,0,0,23,225,0,20,2
8,107,127,107,0,28,23,226,0
,28,62,127,62,28,0,0,23,227
,0,28,62,127,127,127,28,62
270 VDU23,228,255,255,255
,255,255,255,255,255,23,229
,0,94,82,82,82,82,82,94,23,
231,254,252,0,232,72,0,24,1
6
280 VDU23,232,60,255,63,2
55,252,120,64,192,23,233,64
,223,192,111,56,56,16,16,23
,234,1,243,6,252,24,216,0,1
36,23,235,32,34,39,32,32,60
,62,0
290 VDU23,236,132,36,116,
4,4,28,60,0,23,237,16,32,64
,255,64,32,16,0,23,238,0,4,
2,255,2,4,0,0,23,239,16,19,
48,47,32,59,196,223
300 VDU23,240,31,28,159,2
25,7,108,65,241,23,241,12,1
2,51,51,204,204,51,51,23,24
2,204,204,51,51,204,204,48,
48,23,243,143,130,189,224,
135,232,249,56
310 VDU23,244,251,35,220,
4,246,12,200,0,23,245,0,24,
16,18,23,16,63,127,23,246,1
36,140,132,36,116,4,254,255
,23,247,0,60,56,32,32,46,36
,33
320 VDU23,248,0,124,60,4,
4,228,60,4,23,249,17,16,27,
24,63,96,207,128,23,250,0,8
,156,28,246,3,251,2,23,251,
3,2,14,63,255,254,254,60
330 VDU23,252,90,90,126,2
4,24,60,36,36,23,253,255,12

```



```

7,32,46,36,33,49,17,23,1,0;
0;0;0;
340 ENDPROC
350 DEFPROCinit
360 X1X=128:X2X=1093:Y1X=
382:Y2X=382:daX=0:D1X=286:D
2X=286
370 ENVELOPE1,1,10,3,3,15
,1,19,126,0,0,-126,126,126:
ENVELOPE2,1,6,4,6,6,2,6,126
,0,0,-126,126,126:ENVELOPE3
,1,19,-4,0,3,13,20,126,0,0,
-126,126,126:ENVELOPE4,1,29
,3,3,13,20,40,126,0,0,-126,
126,126
380 ENVELOPE5,1,1,-0,8,10
,5,-11,126,0,0,-126,126,126
390 ENDPROC
400 DEFPROCselect_card
410 daX=daX+1:IF daX>52 P
ROCshuffle:daX=0:PROCdata:G
OTO240
420 C=C(NX(daX)):SUIT=SUI
T(NX(daX)):suit$=CHR$(SUIT+
223)
430 IFSUIT=1ORSUIT=3colou
r=1:GC=0ELSEIFSUIT=2ORSUIT=
4colour=0:GC=1
440 XX=448+(RND(20)*10):Y
X=688-(RND(20)*10):VDU5:GC
OL0,colour
450 VDU24,XX,YX-197;XX+16
0;YX+10;:BCOL0,131:CL6:BCOL
0,0:MOVEX,YX+10:DRAWXX+160
,YX+10:DRAWXX+160,YX-197:DR

```

```

AWX,YX-197:DRAWXX,YX+10:GC
OL0,colour
460 ENDPROC
470 DEF PROCshuffle
480 VDU7:VDU24,455;290;85
0;695;:BCOL0,130:CL6:VDU4:P
RINTTAB(2,2)*HANG ON WHILE
I SHUFFLE THE CARDS*:FOR D=
1 TO 1000:NEXT:SOUND0,3,200
,40:SOUND0,0,0,10:SOUND0,3,
200,40:FOR D=1 TO 2500:NEXT
:CLS:VDU5
490 ENDPROC
500 DEF PROCkey
510 VDU24,64;320;1213;800
;:=FX21
520 M$=INKEY$(50+RND(100)
)
530 IF M$="Z" M$=N1$:PROC
snap1:IF Y1X>650 PROCdragon
:time=600:PROCdisplay:PROCw
in
540 IF M$="/" M$=N2$:PROC
snap2:IF Y2X>650 PROCdragon
:time=600:PROCdisplay:PROCw
in
550 IF M$="" AND C(NX(daX
))=C(NX(daX-1)) THEN VDU4:C
LS:SOUND1,2,25,25:A$="PAY A
TTENTION "+N1$+" AND "+N2$:
PRINTTAB(19-(LEN(A$)/2),1);A$
;TAB(6,3)*YOU'VE JUST MISSE
D A PAIR*:FOR D=1 TO 3000:N
EXT:CLS:PROCprint
560 ENDPROC

```



```

570 DEF PROCsnap1
580 IF C(NX(dax))<>C(NX(d
ax-1)) THEN PROCinvalid:END
PROC
590 VDU4:CLS:PRINTTAB(16,
2)*"SNAP!!":VDU5
600 SOUND1,4,200,40:time=
200:PROCdisplay:VDU4:CLS:VD
U5
610 GCOL0,1:MOVE1X,Y1X+3
2:VDU228:GCOL0,2:MOVE1X,Y1
X:VDU228:Y1X=Y1X+32:MOVE144
,670:GCOL0,0:DRAWX1X+16,Y1X
:MOVE144,350:DRAWX1X+16,Y1X
-32
620 D1X=D1X+5:VDU24,120;2
86;169;D1X:GCOL0,128:CLG
630 ENDPROC
640 DEF PROCsnap2
650 IF C(NX(dax))<>C(NX(d
ax-1)) THEN PROCinvalid:END
PROC
660 VDU4:CLS:PRINTTAB(16,
2)*"SNAP!!":VDU5
670 SOUND1,4,200,40:time=
200:PROCdisplay:VDU4:CLS:VD
U5
680 GCOL0,1:MOVE2X,Y2X+3
2:VDU228:GCOL0,2:MOVE2X,Y2
X:VDU228:Y2X=Y2X+32:MOVE110
9,670:GCOL0,0:DRAWX2X+16,Y2
X:MOVE1109,352:DRAWX2X+16,Y
2X-32
690 D2X=D2X+5:VDU24,1000;
286;1129;D2X:GCOL0,128:CLG
700 ENDPROC
710 DEF PROCinvalid
720 SOUND1,2,10,40
730 VDU4:CLS:B$="YOU NEE
D AN EYE TEST "+N$:PRINTTAB
(5,1)*"THE LAST 2 CARDS DON'
T MATCH"TAB(19-(LENB$/2),3)
;B$:FORD=1 TO 2000:NEXT:CLS
:PROCprint
740 ENDPROC
750 DEF PROCdisplay
760 TIME=0:REPEAT:VDU19,R
ND(3),RND(14);0;SOUND1,-15
,RND(200),1:UNTIL TIME>time
:VDU20,19,2,2;0;
770 FOR D=1 TO 1000:NEXT
780 ENDPROC
790 DEF PROCwin
800 VDU4:CLS:PRINTTAB(11,
1)*"WELL DONE "+N$:TAB(9,3)*
"ANOTHER GAME Y or N?"
810 W$=GET$:IF W$<>"Y" AN
D W$<>"N" GOTO 810

```

```

820 IF W$="Y" RUN ELSE CL
S:END
830 ENDPROC
840 DEFPROCdata
850 FORIX=1TO52:NX(IX)=IX
:NEXT:FORIX=52TO2STEP-1:CX=
RND(IX):TX=NX(CX):NX(CX)=NX
(IX):NX(IX)=TX:NEXTIX
860 RESTORE
870 FORI=1TO52
880 READC(I),SUIT(I)
890 NEXT
900 ENDPROC
910 DATA1,1,11,1,2,1,11,2
,12,2,13,2,3,2,12,3,13,4,2,
3,4,2,1,4,3,4,12,1,3,1,1,2,
2,2,13,1,12,2,2,3,13,3,11,3
,13,4,3,3,12,4,11,4
920 DATA13,1,11,1,4,1,12
,1,11,3,1,3,3,2,13,3,1,3,2,
4,4,3,3,4,2,4,2,1,1,1,1,2,
3,1,1,2,2,2,13,2,12,3,11,4,
1,4,3,3,12,4,4,4
930 DEF PROCprint
940 VDU4:PRINTTAB(5,2)*"WA
TCH OUT FOR THE NEXT PAIR!"
:VDU5:ENDPROC
950 DEFPROCcard
960 GCOL0,0:MOVE1X,Y1+10:
DRAWXX+160,Y1+10:DRAWXX+160
,Y1-197:DRAWXX,Y1-197:DRAWX
X,Y1+10:GCOL0,colour
970 SOUND&11,-15,RND(200)
,1
980 IF C=1 GOSUB 1000 ELS
E IF C=2 GOSUB 1010 ELSE IF
C=3 GOSUB 1020 ELSE IF C=4
GOSUB 1030 ELSE IF C=11 G0
SUB 1040 ELSE IF C=12 GOSUB
1050 ELSE IF C=13GOSUB 106
0
990 ENDPROC
1000 MOVEXX+120,YX-155:VDU
65:PROC1:MOVEXX+5,YX:VDU65:
RETURN
1010 PROCc:PROC2:RETURN
1020 PROCc:PROC2:PROC1:RET
URN
1030 PROCc:PROC3:RETURN
1040 PROCj:RETURN
1050 PROCq:RETURN
1060 PROCk:RETURN
1070 DEF PROCc
1080 MOVEXX+5,YX:VDU40+C:M
OVEXX+123,YX-160:VDU40+C:EN
DPROC
1090 DEF PROC1
1100 MOVEXX+64,YX-80:PRINT

```

```

suit$:ENDPROC
1110 DEF PROC2
1120 MOVEXX+64,YX-28:PRINT
suit$:MOVEXX+64,YX-132:PRIN
Tsuit$:ENDPROC
1130 DEF PROC3
1140 MOVEXX+28,YX-28:PRINT
suit$:MOVEXX+28,YX-132:PRIN
Tsuit$:MOVEXX+98,YX-28:PRIN
Tsuit$:MOVEXX+98,YX-132:PRI
NTsuit$:ENDPROC
1150 DEF PROCj
1160 MOVEXX+1,YX:VDU74:MOV
EXX+131,YX-160:VDU74
1170 MOVEXX+65,YX-14:VDU18
,0,6C,253,231,8,8,10,239,24
0,8,8,8,10,18,0,2,241,18,0,
6C,241,8,242,18,0,2,242,8,8
,8,10,18,0,6C,243,244,8,8,1
0,245,246:PROCdraw:ENDPROC
1180 DEF PROCq
1190 MOVEXX+1,YX:VDU81:MOV
EXX+131,YX-160:VDU81
1200 MOVEXX+65,YX-14:VDU18
,0,6C,247,248,8,8,10,249,25
0,8,8,8,10,18,0,2,241,18,0,
6C,241,8,242,18,0,2,242,8,8
,8,10,18,0,6C,233,234,8,8,1
0,235,236:PROCdraw:ENDPROC
1210 DEF PROCk
1220 MOVEXX+1,YX:VDU75:MOV
EXX+131,YX-160:VDU75:GOTO11
70
1230 DEFPROCdraw
1240 MOVEXX+32,YX-14:GCOL0
,0:DRAWXX+130,YX-14:DRAWXX+
130,YX-171:DRAWXX+32,YX-171
:DRAWXX+32,YX-14
1250 GCOL0,colour:MOVEXX+3
6,YX-35:PRINT:suit$:MOVEXX+
92,YX-130:PRINT:suit$
1260 ENDPROC
1270 DEF PROCdragon
1280 VDU23,224,1,3,143,95,
47,15,9,13,23,225,17,189,25
5,255,255,255,0,128,23,226,
28,184,248,248,248,240,144,
216,23,227,80,120,126,120,1
26,24,12,12
1290 VDU23,228,10,30,118,3
0,126,24,48,48,23,229,56,29
,31,31,15,15,9,27,23,230,13
6,221,255,255,255,255,0,1,2
3,231,128,192,241,250,244,2
40,144,176
1300 IF ZX=0 ZX=1:ENDPROC
1310 VDU24,455;290;850;695
;:GCOL0,130:CLG

```

```

1320 VDU24,64;264;1213;800
;
1330 IF N$=N1$ MOVE232,318
:VDU18,0,0,224,225,226,8,11
,227:SOUND0,5,2,50:FOR "=:
TO 30:GCOL0,RND(3):MO
334:DRAWX2X+32,(Y2X+10)-RND
(42):NEXT:ENDPROC
1340 IF N$=N2$ MOVE942,318
:VDU18,0,0,11,228,8,10,229,
230,231:SOUND0,5,2,50:FOR I
=1 TO 60:GCOL0,RND(3):MOVE9
42,334:DRAWX1X,(Y1X+10)-RND
(42):NEXT:ENDPROC
1350 DEF PROCinst
1360 VDU19,3,6;0;:COLOUR2:
PRINTTAB(14,1)*"INSTRUCTIONS
":COLOUR3:PRINT"The cards
are dealt onto the table on
e""by one. If any card va
lue is the same as""the pr
evious card, then you must
press"
1370 PRINT"your control k
ey ahead of your opponent."
""If you're successful you
r lift will move""up, thus
enlarging the entrance to
the""Dragons den.""Whe
n your lift has reached the
top of"
1380 PRINT"its shaft, you
r Dragon will be released."
""It will then attack your
opponents lift""and destr
oy it with its fiery breath
."
1390 COLOUR2:PRINT""CONTR
OL KEYS:-":COLOUR1:PRINT"
PLAYER 1 ":COLOUR2:PRINT"Z
":COLOUR1:PRINT" PLAYER 2
":COLOUR2:PRINT"/""TAB(5)
"PRESS SPACE-BAR TO CONTINU
E":REPEAT UNTIL GET=32
1400 ENDPROC
1410 REM Relocate
1420 DX=PAGE-&E00:*KEY0 *T
.IMFORIX=PAGE TO TOP STEP4:
!(IX-DX)=!IX:NEXT:!(TOP-DX)
=&FF0D:PAGE=&E00:MOLDIMRUN:
M
1430 *FX138,0,128

```

*This listing is included in this month's cassette tape offer. See order form on Page 53.*





Never before have there been such money-saving offers for readers of a computer magazine!

# EXPAND your Electron

... for much, much less than the price you'd normally pay

## How the Plus 1 helps you make the most of your Electron

With the Plus 1, you and your Electron enter a whole new computing dimension. The Plus 1 turns your Electron into a fully fledged micro capable of using printers, joysticks and cartridge ROMs – the software that comes on a chip. In addition, the Plus 1's analogue to digital port gives access to the outside world – while the slots for the ROM cartridges allow the Electron to take advantage of the latest, most exciting hardware developments yet to be released.

*If you want to use your Electron to the full, then it's essential you get a Plus 1.*

Normal

Spec  
for re  
Elect

£39

Inc. F  
ROM

## EXPAND – with the Electron Workstation

Now you can transform your Electron into a serious micro Workstation. This package consists of a Plus 1 and the wordprocessor and Viewsheet spreadsheet, both on cartridge. Workstation makes the Electron a hard-working yet inexpensive office. From business letters to your first novel, from cash flow crises, it can take them all in its stride.

Normal price £119.80

Electron Use

## EXPAND – with the Electron Database Manager

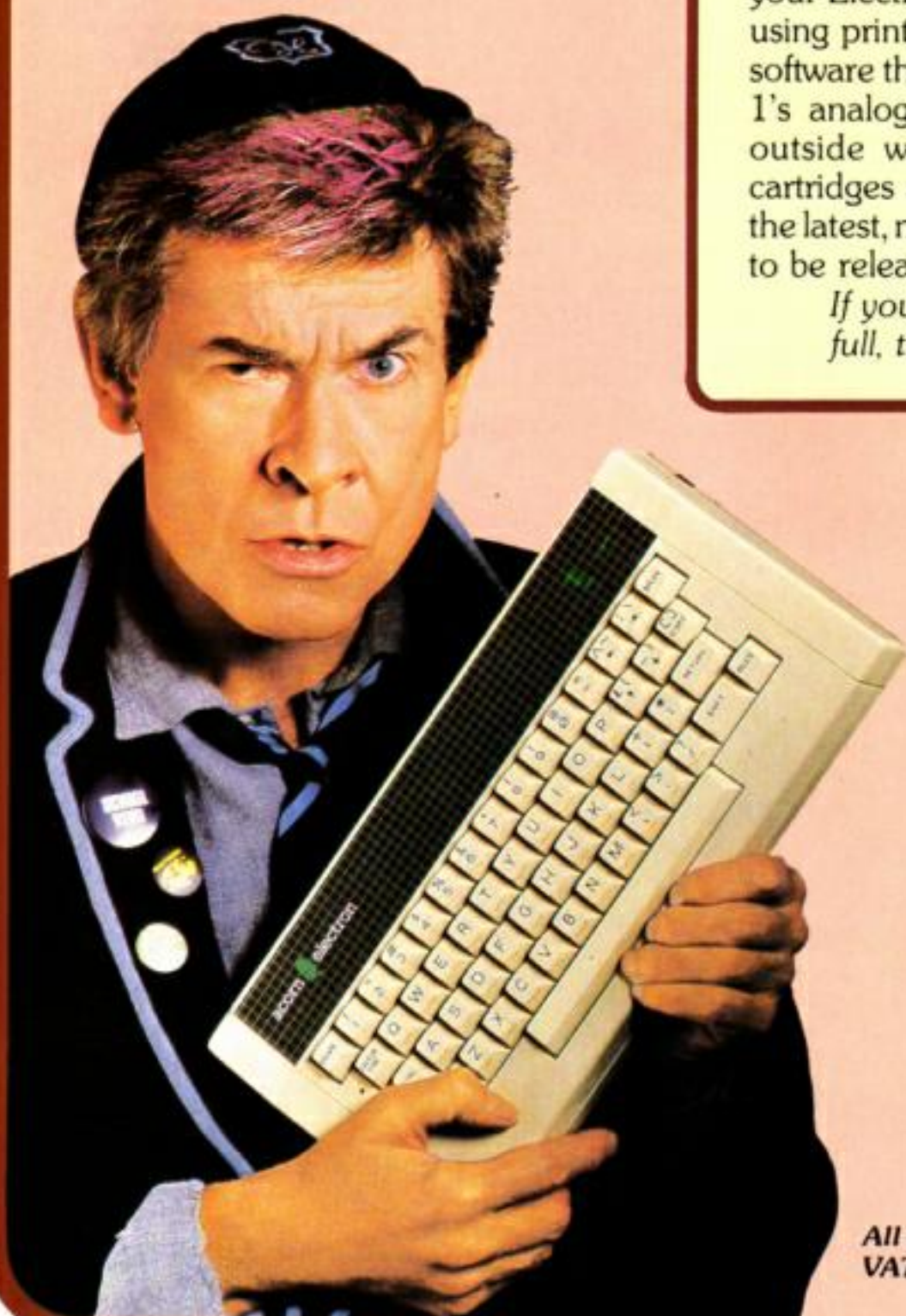
Bring the speed of discs and the organised memory of a personal computer to your Electron with the Electron Data Manager. It consists of a software interface and Acom's official disc-based Database – a disc that can keep track of things quickly, reliably and efficiently. Sophisticated and fast, the Data Manager is a must for all serious Electron users.

Normal price £248.95

Electron Use

All prices include  
VAT and carriage.

**Please use the order form**







ay!

make

price £59.90

ial price  
aders of  
ron User

9.95

REE game  
cartridge

orkstation!

o with the Electron  
ne acclaimed View  
tridge ROMs. The  
nsive tool for home  
home economics to

r price £69.95

ta Manager!

powerful database to  
ists of the Plus 3  
that allows you to  
cated, accurate and  
applications.

r price £149.95

on Page 61

## EXPAND – with the Electron Language Lab

Now you can dramatically extend your programming horizons with this exclusive offer from Electron User. It comes complete with the Plus 1 interface and the Pascal and Logo cartridge ROMs. The Language Lab frees you from the limitations of Basic by giving you the two most educationally favoured high level programming languages – Logo and Pascal.

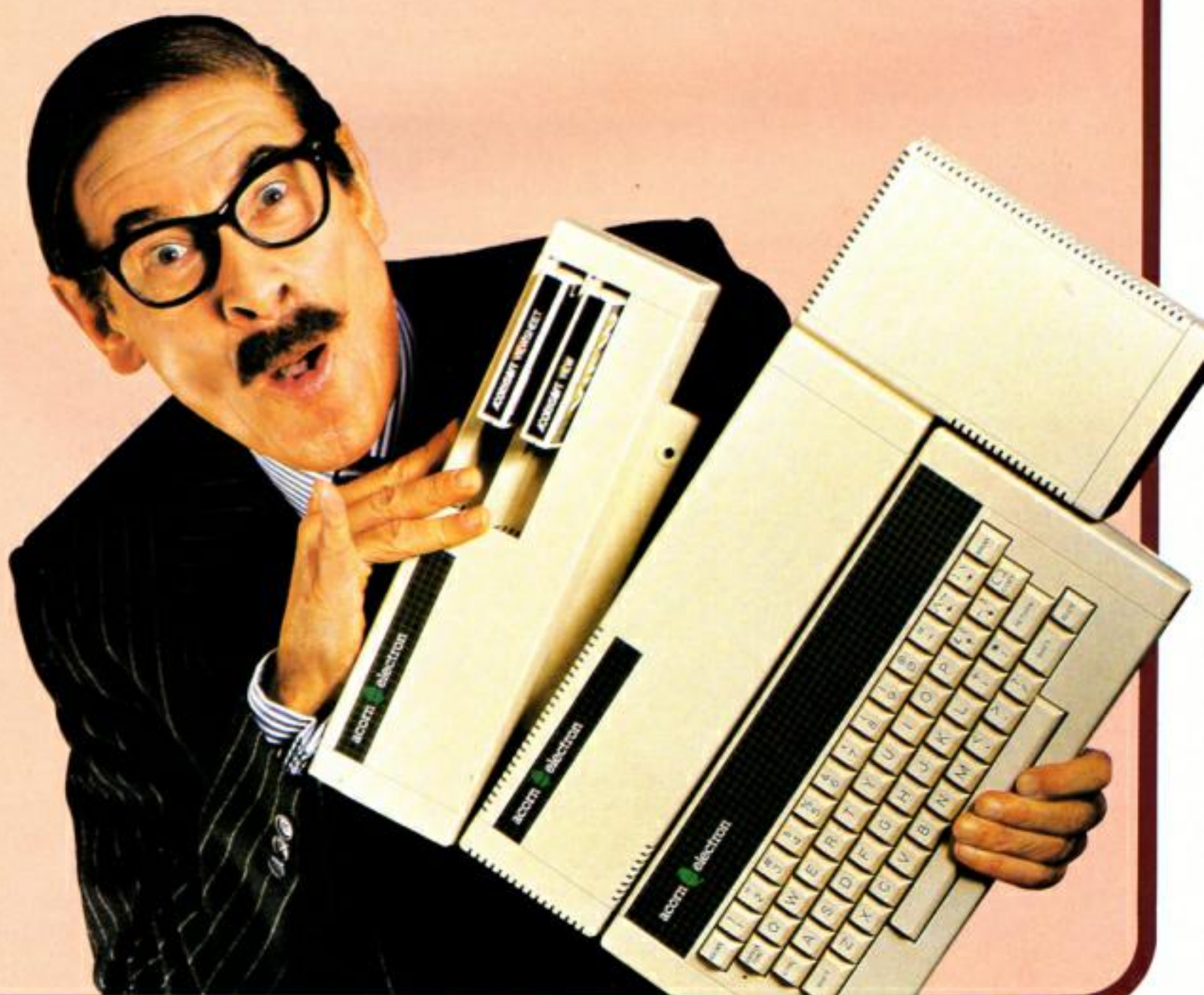
**LOGO:** Acclaimed by teachers, parents and pupils alike, it's the language that's put the fun back into learning the fundamentals of programming. It's simple enough for a child to use, yet complex enough to satisfy the most exacting computer buff.

**PASCAL:** The language that's set the computer world ablaze. When you've programmed in Pascal you'll wonder why you ever used anything else. Powerful, elegant, yet easy to learn, it's a fascinating language designed to improve both programming and programs.

With these exciting languages available instantly on ROM, the Language Lab gives your Electron two new, exciting and very different personalities. It's the best package for the Electron yet. No programmer will want to be without it. And it comes to you at LESS THAN HALF the usual price!

Normal price £197.90

**Electron User price £89.95**





# Royal Wedding



By **GORDON KEY** and **DAVID McLACHLAN**

**TO celebrate the Royal Wedding we've come up with a real teaser – a sliding block puzzle based on the happy occasion.**

When you run the program you will be offered a choice of four inbuilt pictures on the

wedding theme or of loading a pre-recorded Mode 2 screen of your own. You will then be presented with the complete picture.

Once you've studied it, shuffle the picture by pressing Space and attempt to solve

the resultant jumble. The keys you'll need to sort it all out are:

- :** Move tile up.
- /** Move tile down.
- X** Move tile to right.
- Z** Move tile to left.

Space can be pressed at any time to further shuffle the tiles. Should you give up, pressing Return will undo all your moves and any entered by Space, and the puzzle will be solved for you in a few seconds provided less than 2000 moves have been made.

Pressing Escape at any time will return you to the menu so that you can select another picture.

The program's operation is quite simple. Two short machine code routines are assembled at &110 and &900.

The first is used to move a block or tile by accessing the screen directly, and the second prints large letters.

The screen is split into 16 equally sized tiles which are numbered from 0 to 15.

Two integer variables, *N%* and *O%*, are then used to pass the new and old tile numbers to the assembly routine via the CALL statement using the parameter block provided in page six by Basic.

The routine also transfers

the contents of the first variable to the second.

Each time a tile is moved – including random moves generated by pressing Space – the move is recorded by PROCsave. This stores four moves in a single byte of memory starting at &A00.

Due to this efficient method



of storage almost 2000 moves can be safely stored.

Pressing Return solves the problem by simply reversing all moves until the picture is restored.

If the computer beeps while you are playing, it means that the available storage memory is full and you have two options.

You can either press Return to solve the puzzle, or press C to continue, but note that Return will no longer solve the puzzle as the counter (*H%*) is zeroed.

If you select option 5 in order to load your own Mode 2

## VARIABLES

<b>A%</b>	Flag for PROCmove and a CALL variable for PROCbig.
<b>C%</b>	General purpose for colour value.
<b>D%</b>	Start of data storage for saving moves.
<b>E%</b>	Determines souvenir balloon's speed.
<b>F%</b>	Local flag for FNpic5.
<b>H%</b>	Byte pointer for move storage.
<b>I%</b>	Inkey value and secondary counter.
<b>M%</b>	Call address for the machine code routine.
<b>N%</b>	New tile number (the tile that will be moved).
<b>O%</b>	Old tile number (the number of the blank space).
<b>P%</b>	Bit pointer for move storage.
<b>R%</b>	Value for the radius of the circle drawn by PROCc.
<b>'S%</b>	Flag to indicate that at least one move has been saved.
<b>FI%</b>	Number of steps in circle loop.
<b>ST%</b>	Step number.
<b>TY%</b>	Type of circle (filled, not filled, spoked).
<b>COL%</b>	Colour of circle.
<b>c(24)</b>	Cosine array.
<b>s(24)</b>	Sine array.
<b>\$D%</b>	Used by FNpic5 for passing strings to the command line interpreter.



picture this should have been previously saved to tape or disc using the command  
**\*SAVE filename 3000 +5000.**

On selecting this option you are given the choice of entering a filename or a star command.

This facility is useful for cataloguing tape or disc,



changing drives and so on, though take care as some commands could destroy the program (selecting another language for example).

If a disc error occurs this will be displayed for a short period before you are returned to the menu.

When saving your own screen, it is advisable to set up a window using VDU 28,0,31,4,25.

Although this makes reading a little difficult, anything that you type or the computer outputs will print on the part of the screen where the missing tile starts and not destroy your picture.

You should note that due to



the length of the program several sections are deleted after use before the main program is run.

It is therefore essential that you do not add any extra spaces as you type it in and save the program before running it.

Also the program is

downloaded to &1100 if page is higher. This still allows users of most types of DFS to load their own Mode 2 screens. Unfortunately this does not apply to the ADFS, which cannot be used after a download.

The following function keys are defined and called from

within the program:

- f0 Downloads the program if necessary.**
- f1 Deletes all the assembler code.**
- f2 Deletes the instructions.**

**Full listing starts on Page 37**

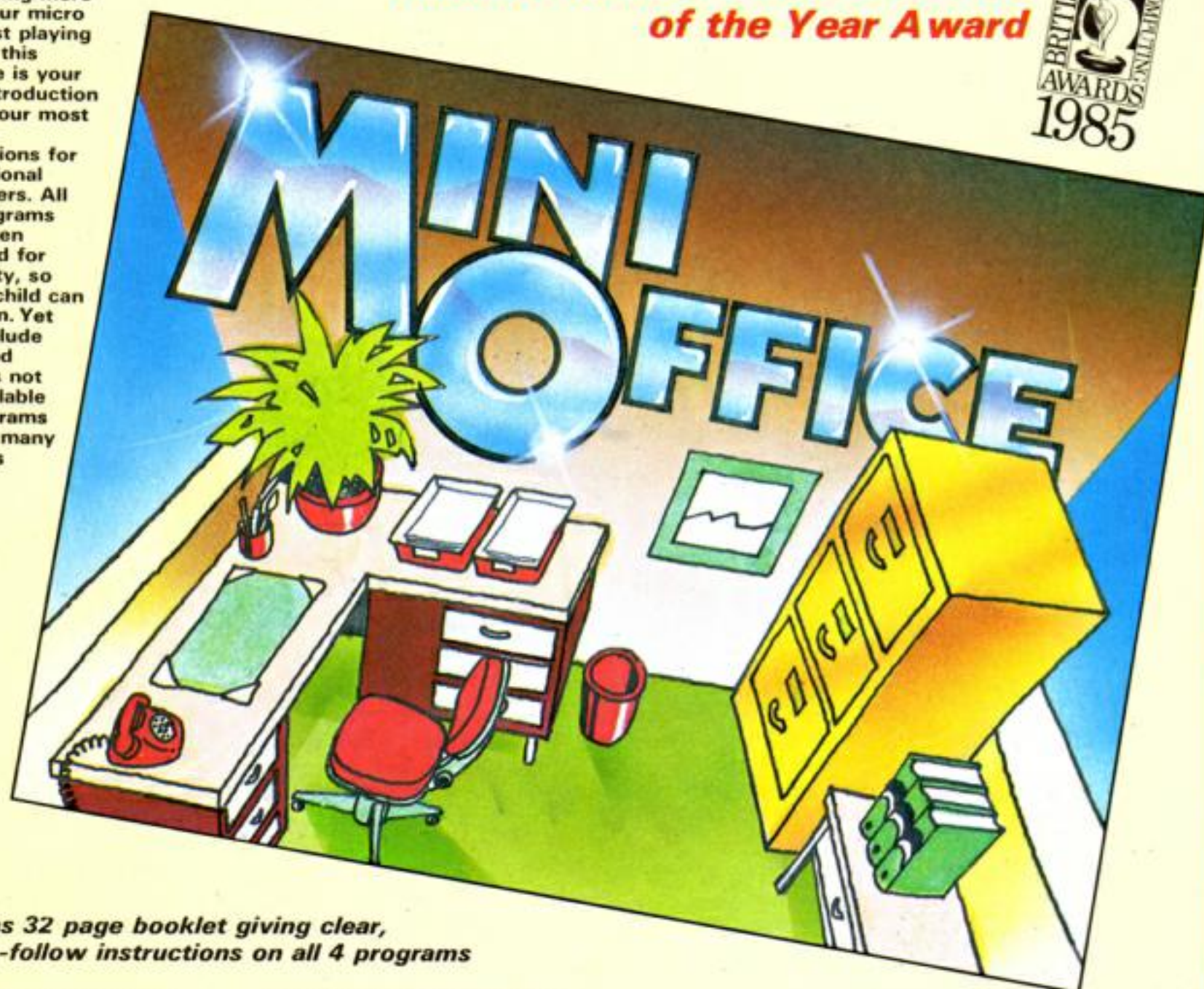
## PROCEDURES

- |   |   |
|---|---|
| <p><b>play</b> The main game repeat loop. Repeats indefinitely until Escape is pressed.</p> <p><b>move</b> If A% is TRUE this procedure makes the souvenir balloon picture move by redefining the actual colour displayed by colour numbers 1 through 12.</p> <p><b>get</b> Gets keyboard input and returns the new title number (N%).</p> <p><b>del (D%)</b> A delay procedure that runs independently of TIME.</p> <p><b>save(h%)</b> Records each move whether entered from the keyboard or generated by PROCshuffle. Each move is stored as a two bit number thus enabling four moves to be stored per byte.</p> <p><b>solve(D%)</b> Solves the puzzle by reversing all moves until the picture is restored.</p> <p><b>shuffle c()</b> Randomly shuffles the picture tiles. Draws a circle controlled by the numerous parameters.</p> | <p><b>grid(gc%)</b> Draws the grid in the colour gc% that separates the 16 picture titles and sets the initial values for the puzzle.</p> <p><b>title</b> Sets the initial program variables and runs the title sequence.</p> <p><b>writeword()</b> Writes word\$ in big letters at x%,y%.</p> <p><b>f(X%,Y%,C%)</b> Fills an area from X%,Y% in the colour C%.</p> <p><b>inst</b> Prints the menu of options, gets the one required and returns a string that tallies with the appropriate picture function.</p> <p><b>dim</b> Dimensions and sets the values of the SIN and COSIN arrays used by PROCs.</p> <p><b>big(A\$,X%,Y%,c%)</b> Prints A\$ at X%,Y% in colour c% and in double height characters.</p> <p><b>code</b> The assembly language procedure for moving the tiles.</p> <p><b>code2</b> The assembly language for the big letters routine.</p> |
|---|---|



If you want to start doing more with your micro than just playing games, this package is your ideal introduction to the four most popular applications for professional computers. All the programs have been designed for simplicity, so even a child can use them. Yet they include advanced features not yet available on programs costing many times as much!

**Finalist for the Home Software  
of the Year Award**



**Contains 32 page booklet giving clear,  
easy-to-follow instructions on all 4 programs**

**Word Processor:** Ideal for writing letters and reports. There is a constant display of both time and word count, plus a words-per-minute display to encourage the budding typist! A unique feature is the double-size text option in both edit and printer mode – perfect for young children and people with poor vision.

**Database:** You use this for storing information, just like an office filing cabinet. Facts you have entered can be quickly retrieved by just keying in a word or part of a word. They can be sorted, replaced, saved for future use or printed out.

**Spreadsheet:** Enables you to use your micro for home accounts or pocket money records. It creates a display of numbers in rows and columns. Continuous updating is possible, and a changed figure can be instantly reflected throughout the rest of the spreadsheet. Your results can be saved, to be used for future updates, or can be fed into its associated program...

**Graphics:** Part of the spreadsheet section, it lets you draw bar charts, pie charts and histograms to give a graphic presentation of your statistics. Helps to give life and colour to the duller figures!

☆ Word Processor  
☆ Database

☆ Spreadsheet  
☆ Graphics

**Now they're  
all together -  
in ONE simple  
package**

Four full-scale  
programs for  
an incredible  
low, low price!

**£5.95**  
cassette

Also available from:

**BOOTS COMET Currys Dixons WHSMITH**

**Greens John Menzies RUMBELOWS spectrum** and other computer stores

**TO ORDER, PLEASE USE THE FORM ON PAGE 53**



# Royal Wedding listing

## From Page 35

```

10REM*****
20REM* ROYAL WEDDING *
30REM* by Gordon Kay & *
40REM* David McLachlan *
50REM*(c) Electron User*
60REM*****
65*FX16
70MODE7:PRINTTAB(12,10)*
Please wait.*
80VDU23;8202;0;0;0;
90VDU21:*FX5
100PROCcode:PROCcode2:*FX
21
110*KEY0FORTX=0TOTOP-PAGE
STEP4:TX!&1100=TX!PAGE:NEX
T!MPAGE=&1100!MO.!MRUN!M
120*KEY1DELETE3320,5110
!MDELETE10,160!MO.!MRUN!M
130*KEY2DELETE2510,2720
!MDELETE170,240!MO.!MRUN!M

140VDU6:PRINTTAB(6,12)*De
leting Assembler Code*:VDU2
1
150*FX130,0,129
160END
170IFPAGE<=&1100 THEN 210

180VDU6:PRINTTAB(12,14)*R
elocating*:VDU21
190*FX130,0,128
200END
210VDU6
220MODE2
230CLEAR
240PROCtitle
250VDU6
260*FX21
270A=GET
280ONERRORIFERR=17THENCE
AR ELSE END
290MODE7
300HINEM=&3000
310AZ=EVAL(FNinst):*FX170
,255,0
320IF gcX<>111 PROCgrid(0
)
330CLEAR
340PROCplay
350END
360DEFPROCplay
370REPEAT
380NX=FNget
390PROCmove
400UNTIL0
410ENDPROC
420DEFPROCmove

```

```

430IFAZ=FALSE ORTIME<EX E
NDPROC
440VDU19,AZ,7;0;:AZ=AXMOD
11+1:VDU19,AZ,4;0;:TIME=0
450ENDPROC
460DEFFNget
470LOCAL hX
480NX=0X
490get=0:IF HX>=500 VDU7:
get=6ET:IF get<>13 AND get<
>67 THEN 490
500IF get=67 HX=0 ELSE IF
get=13 PROCsolve(5)
510IFINKEY(-67)AND0XMOD4N
X=0X-1:hX=1:IX=-67
520IFINKEY(-98)AND0XMOD4<
>3NX=0X+1:hX=2:IX=-98
530IFINKEY(-105)AND0X>3NX
=0X-4:hX=3:IX=-105
540IFINKEY(-73)AND0X<12NX
=0X+4:hX=4:IX=-73
550IFINKEY(-74)ANDSZ PROC
solve(5)
560IFINKEY(-99)PROCshuffl
e
570IFhX PROCs(hX-1):REPEA
T:PROCdel(1):UNTILNOTINKEYI
X
580*FX21
590=NX
600DEFPROCdel(dX)
610LOCALTX
620FORTX=0TODX:PROCmove:N
EXT
630ENDPROC
640DEFPROCcs(hX)
650PX=PX+2:IFPX=0:HX=HX+1
:PX=0:HX?DX=0
660hX=hX+2^PX:HX?DX=HX?DX
OR hX:SOUND&10,-15,4,1:SZ=
TRUE
670CALLMX,NX,0X
680ENDPROC
690DEFPROCsolve(dX)
700LOCALhX
710REPEAT
720hX=(HX?DX AND3+2^PX)DI
V2^PX
730NX=0X+(1-(hX)1)*3*(1+
((hXAND1)=1)*2)
740CALLMX,NX,0X
750PROCdel(dX)
760SOUND&10,-15,5,1
770PX=PX-2:IFPX<0 HX=HX-1
:PX=6
780UNTILHX=-1
790SZ=FALSE
800ENDPROC
810DEFPROCshuffle

```

```

820LOCALfX,qX,hX
830FORTX=0TOD40
840qX=fX
850fX=FALSE:REPEAT
860REPEAT
870PROCmove
880hX=RND(4)
890UNTILhX<>qX
900IFhX=1AND0XMOD4:NX=0X-
1:fX=2
910IFhX=2AND0XMOD4<>3:NX=
0X+1:fX=1
920IFhX=3AND0X>3:NX=0X-4:
fX=4
930IFhX=4AND0X<12:NX=0X+4
:fX=3
940UNTILfX
950PROCcs(hX-1)
960NEXT
970ENDPROC
980DEFFNpic1
990VDU22,2,23;8202;0;0;0;
1000PROCdie
1010PROCgrid(3)
1020RESTORE3190
1030COL0,7
1040FORLX=1 TO 105
1050READ XX,YX
1060IF XX=0 AND YX=0 READ
XX,YX:MOVE XX-100,YX
1070DRAW XX-100,YX
1080NEXT
1090FOR LO=0 TO 420 STEP 4
20
1100RESTORE3240
1110READ XX,YX:MOVE XX+LO-
100,YX
1120FOR LOOP=1 TO 6:READ X
X,YX:PLOT 1,XX,YX:NEXT
1130NEXT
1140COL0,7
1150RESTORE3190
1160FOR LX=1 TO 69
1170READ XX,YX
1180IF XX=0 AND YX=0 READ
XX,YX:MOVE XX+320,YX
1190DRAW XX+320,YX
1200NEXT
1210PROCc(340,570,50,24,2,
1,3):PROCc(340,570,25,24,2,
1,1):PROCc(552,390,85,12,1,
2,7):PROCc(552,130,75,12,1,
2,7):PROCc(760,570,50,24,2,
1,3):PROCc(760,570,25,24,2,
1,1):PROCf(550,5,1):PROCf(2
70,900,4)
1220PROCf(415,900,4):PROCf
(685,900,4):PROCf(835,900,4
):PROCf(270,850,4):PROCf(69

```

```

0,850,4):PROCf(350,850,4)
1230RESTORE3250
1240FOR QX=1 TO 8:READ Z:6
COL0,Z
1250FOR BX=1 TO 4:READ A,B
,C:PLOT A,B,C
1260NEXT:NEXT
1270FOR X=1 TO 20
1280MOVE 1110,200
1290COL0,1:XX=RND(200)+1
000:YX=RND(200)+200:DRAW XX
,YX:PROCc(XX,YX,30,12,2,1,2
)
1300NEXT
1310FOR X=1 TO 25:XX=RND(2
00)+1000:YX=RND(200)+200:PR
OCc(XX,YX,30,12,2,1,2):NEXT
1320seagull$=CHR$(230)+CHR
$(231):flap1$=CHR$(234)+CHR
$(232):flap2$=CHR$(235)+CHR
$(233)
1330VDU5:6COL0,7:MOVE 1024
,896:PRINT seagull$
1340COL0,8:MOVE 1024,896:
PRINTflap1$
1350COL0,15:MOVE 1024,896
:PRINTflap2$
1360COL0,7:MOVE 1000,736
:PRINTseagull$
1370COL0,15:MOVE 1000,73
6:PRINTflap1$
1380COL0,8:MOVE 1000,736
:PRINTflap2$
1390gcX=111
1400=FALSE
1410DEF PROCf(XX,YX,CX)
1420YX=YX
1430COL0,CX
1440REPEAT
1450PLOT 77,XX,YX
1460YX=YX+4
1470UNTIL POINT(XX,YX)
1480YX=YX
1490REPEAT
1500PLOT 77,XX,YX
1510YX=YX-4
1520UNTIL POINT(XX,YX)
1530ENDPROC
1540DEFFNpic3
1550VDU22,2,23;8202;0;0;0;
1560VDU20,1,1,0,0,0,VDU26
,1279;1023;VDU19,3,4,0,0,0
,6COL0,129:CL6:6COL0,7
1570gcX=0:RESTORE3270
1580FOR LOOP=1 TO 2
1590FOR LOOP2=1 TO 24
1600READ A,B,C,:PLOT A,B,C

```



## Royal Wedding listing

### From Page 37

```

1610NEXT
1620READ D:GCOL 0,D
1630NEXT
1640=FALSE
1650DEFFNpic2
1660VDU22,2,23;8202;0;0;0;
1670GCOL 0,135:CLG
1680PROCdim
1690PROCgrid(0)
1700PROCc(450,700,200,24,1
,1,1)
1710PROCc(840,700,200,24,1
,1,1)
1720MOVE 270,620:DRAW 645,
50:PLOT 85,1025,620
1730DRAW 650,660:PLOT 85,2
70,620
1740LX=&900:LY=3:LX?1=4:L
X?2=16:LY?3=16
1750CALL (LX+&C2)
1760GCOL 0,4
1770PROCwriteword(200,800,
"Andrew")
1780PROCwriteword(565,550,
"&")
1790PROCwriteword(300,300,
"Sarah")
1800gcx=111
1810=FALSE
1820DEF PROCwriteword(x,y
x,word$)
1830LX!4=xX:LX!6=yY
1840FOR LX=1 TO LEN(word$)
1850LX?&C=ASC(MID$(word$,
LX,1))
1860CALL (LX+&15)
1870NEXT
1880ENDPROC
1890DEFFNpic4
1900VDU22,2,23;8202;0;0;0;
1910PROCdim
1920VDU19,15,7;0;
1930COLOUR143:CLS
1940FORTX=1TO12
1950GCOL 0,TX
1960VDU19,TX,4;0;
1970IX=TX*2
1980PROCc(640+475*c(IX),51
2+375*s(IX),100,24,1,1,TX)

1990MOVE640+475*c(IX),512+
375*s(IX):DRAW640,512
2000VDU19,TX,7;0;
2010NEXT
2020VDU19,4,4;0;
2030EX=10:gcx=0
2040=4

```

```

2050DEFFNpic5
2060LOCALFX:FX170,255,0
2070REPEAT
2080FX=FALSE
2090CLS:gcx=0
2100PRINTTAB(0,5)"Please e
nter the required filename"
2110PRINT"or a '*' command
..."
2120INPUT$DX
2130IFLEFT$(DX,1)<>"*"DX
="LOAD "+DX+" 3000":VDU22,
2,23;8202;0;0;0;VDU28,0,31
,4,25 ELSEFX=TRUE
2140XX=DXMOD256:YY=DXDIV25
6:CALL&FFF7
2150*FX21
2160IFFX PRINT""Please pr
ess space":REPEATUNTILGET=3
2:UNTILFALSE
2170UNTILTRUE
2180=FALSE
2190DEFPROCc(X,Y,RX,FX,
STX,TYX,COLX)
2200GCOL 0,COLX
2210IF STX=2 AND FX=24 FI
X=23
2220LOCALTX
2230MOVEXX,YX
2240FORTX=0TO FX STEP STX

2250MOVEXX,YX
2260IF STX=2 DRAW XX+c(TX)
*RX,YX+s(TX)*RX
2270IF STX=2 PLOT85,XX+c(T
X+1)*RX,YX+s(TX+1)*RX
2280IF STX=1 AND TYX=1 PLO
T85,XX+c(TX)*RX,YX+s(TX)*RX
2290IF TYX=2 MOVE XX+c(TX)
*RX,YX+s(TX)*RX:DRAW XX+c(T
X+1)*RX,YX+s(TX+1)*RX
2300PLOT85,XX+c(TX)*RX,YX+
s(TX)*RX
2310NEXT
2320ENDPROC
2330DEFPROCgrid(gcx)
2340GCOL 0,gcx
2350FORXX=0TO1279STEP320
2360MOVEXX,0
2370DRAWXX,1024
2380NEXT
2390FORYX=0TO1023STEP256
2400MOVE0,YX
2410PLOT0,0,4
2420PLOT81,1280,-4
2430PLOT81,0,4
2440NEXT
2450IF gcx<>0 MOVE 1279,0:
DRAW 1279,1023:DRAW 0,1023

```

```

2460GCOL 0,128
2470VDU24,0;0;320;256;:CLG
:VDU26
2480HX=-1:PX=6
2490OX=12:SY=FALSE
2500ENDPROC
2510DEFPROCtitle
2520AX=0:VDU23;8202;0;0;0;
2530COLOUR135
2540CLS:VDU19,2,4;0;
2550PROCbig("ROYAL",7,8,2)
2560PROCbig("WEDDING",6,13
,1)
2570PROCdel(100)
2580PRINTTAB(2,19)"By Gord
on Key &"
2590PRINTTAB(2,22)"David M
cLachlan"
2600PROCdel(200):PROCgrid(
0):AX=FALSE:PROCshuffle:PRO
Cdel(100):PROCsolve(1):PROC
del(200)
2610CLS
2620PRINTTAB(1,1)"TO MOVE
BLOCKS USE":PRINTTAB(1,3)"T
HE FOLLOWING KEYS"
2630COLOUR 2:PRINTTAB(3,0)
"Z.....Left"
2640PRINTTAB(3,11)"X.....
.Right"
2650PRINTTAB(3,14)":.....
.Up"
2660PRINTTAB(3,17)"/.....
.Down"
2670PRINTTAB(3,20)"Space..
.Shuffle"
2680PRINTTAB(3,23)"Return.
.Reset"
2690COLOUR 1:PRINTTAB(2,20)
)"Any key to start"
2700VDU21,19,2,2;0;
2710*FX130,0,130
2720END
2730DEFFNinst
2740VDU22,7:VDU23;8202;0;0
;0;
2750FORTX=2TO23:PRINTTAB(0
,TX)CHR$157CHR$132TAB(30)CH
R$156:NEXT
2760VDU28,2,23,37,2
2770CX=65
2780PRINTTAB(5,1)"R O Y A
L W E D D I N G"
2800PRINT:RESTORE 3310
2810REPEAT
2820READA$:UNTILLEN(A$)>5
2830REPEAT
2840PRINTTAB(4);CHR$(CX);C
HR$(VAL(RIGHT$(A$,3)))STRIN

```

```

6$(0,".")LEFT$(A$,LEN(A$)-3
)'
2850READA$
2860CX=CX+1
2870UNTIL A$="E"
2880PRINTTAB(4)"Escape ...
To return to menu"
2890PRINT""TAB(3)CHR$129"P
lease select a letter"
2900*FX21
2910REPEAT
2920TX=GET AND &DF
2930UNTILTX>64 ANDTX<70
2935*FX170,0,0
2940="FNpic"+STR$(TX-64)
2950ENDPROC
2960DEFPROCdim
2970DIMc(24),s(24)
2980TX=0
2990FORT=0TO2*PI STEP2*PI/
24
3000c(TX)=COS(T):s(TX)=SIN
(T)
3010TX=TX+1:NEXT
3020ENDPROC
3030DEFPROCbig(A$,XX,YX,cX
)
3040VDU31,XX,YX
3050COLOURcX
3060LOCALaX,bX,dX,AX
3070FORaX=1TOLENA$
3080?DX=ASC(MID$(A$,aX,1))
3090SOUND1,2,?DX,1
3100XX=DXMOD256:YY=DXDIV25
6:AX=&A:CALL&FFF1
3110FORbX=0TO1
3120VDU23,bX+130
3130FORcX=0TO3:FORdX=0TO1
3140VDUDX?(cX+bX*4+1)
3150NEXT:NEXT:NEXT
3160VDU130,10,0,131,11
3170NEXT
3180ENDPROC
3190DATA 0,0,330,855,340,0
55,365,900,390,855,490,855,
515,900,540,855,550,855,550
,820,540,820,540,770,490,77
0,440,805,390,770,340,770,3
40,820,540,820,330,820,330,
855,550,855,0,0,340,770,340
,630,390,630,390,770
3200DATA 0,0,390,630,490,6
30,490,770,0,0,490,630,540,
630,540,770,540,0,340,0,340
,630,340,600,400,600,0,0,40
0,600,540,600,0,0,340,500,5
40,500,0,0,340,475,540,475,
0,0,340,325,390,325,390,425
,440,455,490,425,490,325,54

```





To mark the happy occasion we've included this superb digitised picture of the Royal couple in our monthly tape. There's also a conversion program to allow it to be used in the sliding block puzzle. Turn to Page 50.

```
0,325,390,325
3210DATA 0,0,340,225,405,2
25,0,0,475,225,540,225,540,
210,490,210,440,250,390,210
,340,210,390,210,390,120,34
0,120,390,120,390,0,490,0,4
90,120,540,120,490,120,490,
210,0,0,540,520,760,520,752
,520,650,630,552,520
3220DATA 0,0,650,600,632,5
00,632,540,672,540,672,580,
650,600,0,0,540,505,760,505
,0,0,540,480,760,480,0,0,54
0,230,565,230,565,390,565,2
30,737,230,737,390,737,230,
760,230,760,215,540,215,0,0
,540,340,565,340
3230DATA 0,0,745,340,760,3
40,760,130,725,130,725,0,57
5,0,575,130,540,130,540,0,7
60,0
3240DATA 440,055,0,125,0,-
10,10,0,0,-70,-10,0,10,0
3250DATA 0,4,345,900,1,40,1
0,1,0,65,1,-40,-15,0,4,770,
900,1,40,10,1,0,70,1,-40,-1
0,15,4,770,900,1,50,40,1,0,
70,1,-50,-40,15,4,350,900,1
,45,40,1,0,70,1,-45,-40,7,4
,390,934,5,390,930,4,810,93
4,5,810,930,1,4,1005,0,1,0,
40,4,1093,0,1,0,100
3260DATA 1,4,1130,0,1,0,70,
4,1100,0,1,0,250,1,1,25,0,1
,0,-250,1,-6,0,1,0,250
3270DATA 4,0,00,5,440,430,0
5,0,430,4,0,590,5,440,590,0
```

```
5,0,940,4,00,1023,5,560,640
,85,560,1023,4,720,1023,5,7
20,640,85,1200,1023,4,1279,
940,5,840,590,85,1279,590,4
,1279,430,5,840,430,85,1279
,80,4,1200,0,5,720,380,85,7
20,0,4,560,0,5,560,380
3280DATA 85,80,0,3,4,0,660,
5,290,660,85,0,900,4,100,10
23,5,520,750,85,520,1023,4,
790,1023,5,790,740,85,1140,
1023,4,1279,860,5,1000,640,
85,1279,640,4,1279,360,5,90
0,360,85,1279,120,4,1100,0,
5,760,260
3290DATA 85,760,0,4,490,0,5
,490,270,85,140,0,4,0,160,5
,280,380,85,0,380,0
3300DATA 6,134,16
3310DATA Westminster Abbey
132,Royal couple132,Union J
ack132,Souvenir balloon132,
Load own picture132,E,1,4,6
,9
3320DEFPROCcode
3330scrnpint=&00
3340varpoint=&70
3350FORTX=&0TO2STEP2
3360PX=&110
3370MX=PX
3380OPTTX
3381SEI
3390LDA&601:STAVarpoint
3400LDA&602:STAVarpoint+1
3410LDA&604:STAVarpoint+2
3420LDA&605:STAVarpoint+3
3430LDY00
```

```
3440LDA(varpoint+2),Y:AND#
15
3450TAX
3460LDApointer1,X:STAscrnp
oint+2
3470LDApointerh,X:STAscrnp
oint+3
3480LDA(varpoint),Y:AND#15
3490STA(varpoint+2),Y
3500TAX
3510LDApointer1,X:STAscrnp
oint
3520LDApointerh,X:STAscrnp
oint+1
3530LDX00
3540.loop1
3550LDY#160
3560.loop2
3570LDA(scrnpint),Y
3580STA(scrnpint+2),Y
3590LDA00
3600STA(scrnpint),Y
3610DEY:BNEloop2
3620DEX:BEQout
3630CLC:LDAscrnpint
3640ADC#&00:STAscrnpint
3650LDAscrnpint+1
3660ADC#2:STAscrnpint+1
3670CLC:LDAscrnpint+2
3680ADC#&00:STAscrnpint+2
3690LDAscrnpint+3
3700ADC#2:STAscrnpint+3
3710SEC:BCSloop1
3720.out CLI
3730RTS
3740.pointer1
3750:PX=PX+16:[OPTTX
```

```
3760.pointerh
3770: NEXT
3780DX=&A00
3790FORYX=&0TO3
3800FORXZ=&0TO3
3810AX=&3000+XX*160+YZ*&14
00-1
3820pointer1?(XX+YZ*4)=AXM
00256
3830pointerh?(XX+YZ*4)=AXD
IV256
3840NEXT
3850NEXT
3860ENVELOPE1,0,0,0,0,0,0,
0,126,-4,-3,-3,126,100
3870ENVELOPE2,1,0,0,0,0,0,
0,63,43,0,-63,63,126
3880VDU6,23,230,0,0,112,29
,7,1,1,0
3890VDU23,231,0,0,14,184,2
24,128,128,0
3900VDU23,232,1,3,0,0,0,0,
0,0
3910VDU23,233,0,0,0,3,0,0,
0,0
3920VDU23,234,128,192,0,0,
0,0,0,0
3930VDU23,235,0,0,0,192,0,
0,0,0,21
3940ENDPROC
3950DEFPROCcode2
3960 OSWORD=&FFF1
3970 OSWRCH=&FFEE
3980 FOR passX=0 TO 2 STEP 2
3990PX=&900
4000 [
4010 OPT passX
4020 .width NOP
4030 .depth NOP
4040 .xstep NOP
4050 .ystep NOP
4060 .xpos NOP:NOP
4070 .ypos NOP:NOP
4080 .xstore NOP:NOP
4090 .ystore NOP:NOP
4100 .pattern NOP
4110 ]
4120 $PX="12345678"
4130 PX=PX+8
4140 [ OPT passX
4150 .start LDY # pattern
MOD 256
4160 LDY # pattern DIV 256
4170 LDA # &0A
4180 JSR OSWORD
4190 LDA ypos
4200 STA ystore
```



## Royal Wedding listing

### From Page 39

4210 LDA ypos+1  
4220 STA ystore+1  
4230 LDY # 0  
4240 .outer\_loop LDA xpos  
4250 STA xstore  
4260 LDA xpos+1  
4270 STA xstore+1  
4280 LDA pattern+1,Y  
4290 LDX # 0  
4300 .inner\_loop ASL A  
4310 BCC noprint  
4320 PHA  
4330 TXA:PHA  
4340 TYA:PHA  
4350 JSR write  
4360 PLA:TYA  
4370 PLA:TXA  
4380 PLA  
4390 .noprint PHA  
4400 CLC  
4410 LDA xstore  
4420 ADC xstep

4430 STA xstore  
4440 LDA xstore+1  
4450 ADC # 0  
4460 STA xstore+1  
4470 PLA  
4480 INX  
4490 CPX # 0  
4500 BNE inner\_loop  
4510 SEC  
4520 LDA ystore  
4530 SBC ystep  
4540 STA ystore  
4550 LDA ystore+1  
4560 SBC # 0  
4570 STA ystore+1  
4580 INY  
4590 CPY # 0  
4600 BNE outer\_loop  
4610 CLC  
4620 LDA xstore  
4630 ADC xstep  
4640 STA xpos  
4650 LDA xstore+1  
4660 ADC # 0  
4670 STA xpos+1

4680 RTS  
4690 .write LDA # 5  
4700 JSR OSWRCH  
4710 LDA # &19  
4720 JSR OSWRCH  
4730 LDA # 4  
4740 JSR OSWRCH  
4750 LDA xstore  
4760 JSR OSWRCH  
4770 LDA xstore+1  
4780 JSR OSWRCH  
4790 LDA ystore  
4800 JSR OSWRCH  
4810 LDA ystore+1  
4820 JSR OSWRCH  
4830 LDA # &E0  
4840 JSR OSWRCH  
4850 LDA # 4  
4860 JSR OSWRCH  
4870 RTS  
4880 .definer LDA # 23  
4890 JSR OSWRCH  
4900 LDA # &E0  
4910 JSR OSWRCH  
4920 LDA # 0

4930 LDX width  
4940 .define\_row SEC  
4950 ROR A  
4960 DEX  
4970 BNE define\_row  
4980 LDY depth  
4990 .send\_rows JSR OSWRCH  
5000 DEY  
5010 BNE send\_rows  
5020 .send\_blanks  
5030 LDY # 0  
5040 LDA # 0  
5050 .blank JSR OSWRCH  
5060 DEY  
5070 BNE blank  
5080 RTS  
5090 J  
5100 NEXT pass%  
5110ENDPROC

*This listing is included in this month's cassette tape offer. See order form on Page 53.*

QUAL-SOFT

# THOUGHTWARE

Sports simulations

*"MEXICO '86 is an excellent simulation that will challenge all budding managers".*



NOVA (Nova rating: "You should immediately rush out and buy it").

Value for Money ●●●●● (Computer Gamer June 1986).

**TAPE 1  
QUALIFIERS**

## MEXICO '86\*

**TAPE 2  
FINALS**

### A WORLD CUP MANAGEMENT SIMULATION

Summer 1984 and English International football is at its lowest ebb. We have failed to qualify for the European Nations Cup, and had a string of very poor International results. In a few months we will set out on the '86 World Cup qualifying trail. You have been given the most important job of restoring English pride in their football. You have a match in Paris, the USSR at Wembley, and a South American tour, to assemble a team, first to qualify, and then to beat the world's best in Mexico.

#### TAPE 1 (Qualifiers)

- ★ Current squad of 16 players + 20 user defined players.
- ★ Friendlies in Paris, at Wembley + South American tour.
- ★ ANY team formation you choose, 2 from 5 substitutes.
- ★ In match tactics: any no. of individual player adjustments.
- ★ Your qualification group: full results and table.

#### TAPE 2 (Finals)

- ★ Choose a 20 man squad to take to the finals.
- ★ Group of 4 prelims, 16 to final knockout comp.
- ★ Extra Time, PENALTY SHOOT-OUTS, where relevant.
- ★ Formation and strength information on opposition.
- ★ 2 from 9 substitutes (the FA tells us so).

### THE ONLY ELECTRON SOCCER MANAGEMENT SIMULATION WITH SOUND AND GRAPHICS

QUAL-SOFT comments: With 5 levels of play, 12 depths of sophistication, and "fun" graphics, this game can be enjoyed by an 8 year old youngster as a "fun" game, and by the most sophisticated as a tactical/strategy challenge of the highest order.

**PACKAGE:** Tape 1 plus Tape 2 plus 20 Page Manual in "Video Cassette" style pack. Only £9.95 (57K RAM usage. Some would call this a MEGAGAME.) YES IT WILL RUN ON YOUR 32k ELECTRON.

**QUALSOFT GUARANTEE:** Sent by 1ST CLASS POST on day the order with P.O., Cheque, Access payment is received. Telephone Access orders accepted.

\* The use of the name MEXICO '86 does not imply any association with FIFA

**QUAL-SOFT.**  
Dept. EU  
18 Hazelmere Rd.,  
Stevenage, Herts SG2 8RX.

**Tel: 0438  
721936**

Please supply:  
MEXICO '86  
Electron ☐  
BBC 'B' ☐

Name: .....  
Address: .....  
Access No. (if applicable) .....



# OSWORD

In the final part of this series  
JOHN WOOLLARD explains the  
five remaining Osword calls

**THIS** is our last venture into the world of Osword in this series. There are five calls left to be explained and first we'll take a look at those concerned with the internal elapsed time clock – Oswords 1 and 2 – and the interval timer – Osword 3 and 4.

The internal clock counts the time in hundredths of a second and it starts the very moment your micro is switched on. To discover its value simply enter:

## PRINT TIME

The result, TIME, is a number between zero and several billion. We can use that value to set and then read the real time. To convert the numbers to hours, minutes and seconds requires these operations:

```
seconds = (TIME DIV 100)
          MOD 60
minutes = (TIME DIV 6000)
          MOD 60
hours = (TIME DIV 360000)
        MOD 24
```

Remember also that the clock ticks 100 times per second, so 100 is 1 second,  $2 \times 100$  is 2 seconds ...  $60 \times 100$  is 60 seconds or one minute and so on. Conversely to set the TIME – ignoring seconds – simply enter:

```
TIME=hours*360000+minutes*6000
```

The interval timer is another clock similar to the internal clock and again it increments every hundredth of a second.

However it is different in that its value cannot be found using Basic instructions. We'll see shortly how Osword calls 3 and 4 are used to read and write its value.

Program I illustrates the basic principle of making Osword calls. They all require a parameter block so that data may be passed to or received from the routine summoned.

That block can be placed anywhere in the memory of the computer. Its address is placed in the X and Y registers

before the call is made, X taking the lo-byte and Y the hi-byte.

Figure I shows the structure of the parameter block that passes the value of the internal clock TIME in Program I. It's located immediately after the code and is labelled *time*.

X is made equal to *time* MOD 256 – the lo-byte – and Y equal to *time* DIV 256 – the hi-byte. Running the program sets TIME to zero – it prints the value before and after the machine code call is made.

Let's see how the internal clock can be used. The maximum value that is of interest to most users is 24 hours which is  $24 \times 60 \times 60 \times 100$  or 8640000. This can be stored in three bytes.

However Oswords read and write TIME as five bytes, so the top two bytes of the parameter block are unnecessary and are set to zero. The

other three take on a value which is equivalent to  $360000 \times \text{hours} + 6000 \times \text{minutes} + 100 \times \text{seconds}$ .

Program I can easily be modified to set the internal clock to the current time. Here's an example that sets TIME to half past one in the afternoon (13:30:00) –  $360000 \times 13 + 6000 \times 30$ , or 4680000. In hex that's &476940. Change lines 120 to 160 of Program I to:

```
160 EQU 40
170 EQU 69
180 EQU 47
190 EQU 40
200 EQU 40
```

and run it again.

It should be noted that the parameter block contains the least significant number first – the highest two values in the

Block	Value
YX	Least significant byte of TIME.
YX+1	—
YX+2	—
YX+3	—
YX+4	Most significant byte of TIME.

Figure I: Parameter blocks for Osword calls 1 to 4

Block	Value
YX	Low byte of buffer address.
YX+1	High byte of buffer address.
YX+2	Maximum length of input line.
YX+3	Minimum acceptable Ascii value.
YX+4	Maximum acceptable Ascii value.

On exit C=0 if Return is pressed. C=1 if Escape is pressed.  
Y=length of input string.  
Control+U is used to delete the whole input – the Delete key only removes the last character entered.

Figure II: Parameter block for Osword call A=0

```
10 REM PROGRAM I
20 osword = &FFF1
30 program = &900
40 FOR opt=0 TO 2 STEP 2
50 PX = program
60 [OPT opt
70 LDX# time MOD 256
80 LDY# time DIV 256
90 LDA# 2 : JSR osword
100 RTS
110 .time
120 EQU 0
130 EQU 0
140 EQU 0
150 EQU 0
160 EQU 0
170 ]
180 NEXT
190 PRINT"TIME = ";TIME
200 CALL program
210 PRINT"TIME = ";TIME
```

Program I

```
10 REM PROGRAM II
20 osword = &FFF1
30 program = &900
40 FOR opt=0 TO 2 STEP 2
50 PX = program
60 [OPT opt
70 LDX# time MOD 256
80 LDY# time DIV 256
90 LDA# 1 : JSR osword
100 RTS
110 .time
120 EQU 0
130 EQU 0
140 EQU 0
150 EQU 0
160 EQU 0
170 ]
180 NEXT
190 CALL program
200 PRINT"TIME = ";TIME
210 PRINT"!time = ";!time
```

Program II



## From Page 41

block being set to zero.

Program II uses Osword 1 to read the clock. The result is placed in the parameter block *time*. Line 200 prints the value of TIME and line 210 prints the contents of the block.

The reason they are sometimes different is that TIME may be incremented in the period between the computer processing line 190 then 200.

The internal clock is useful in programs if the real time needs to be displayed. By setting it at the start of the program the time can be printed out by converting the

value of TIME to seconds, minutes and hours.

We'll now consider that other clock, the interval timer. In many ways this is a much more powerful tool than TIME, but unfortunately its value cannot be read or written directly from Basic.

Program III shows how the timer is read using Osword with A=3. Like the programs for reading and writing the value of TIME the parameter block contains five bytes of data.

The usefulness of the interval timer is that it can generate interrupts. If you're not sure what interrupts are then have

a look at the last in the Osbyte series in the February 1986 issue of *Electron User*.

Briefly, your micro has been designed so that certain events or happenings are immediately and automatically communicated to the central processor. The computer can be made to act in a specific way on receiving a particular signal.

One of those events occurs when the interval timer crosses zero. It's like a 24 hour clock at 0:00:00 midnight going right

round and back to 0:00:00 at midnight the next day.

There are four steps we have to take to make this a useful technique.

- Set up a machine code routine that you wish to occur at a predetermined time when the event occurs.
- Place the address of the start of the machine code routine in locations &220 and &221, i.e. then hi byte.
- Activate the interrupt using the Osbyte call A=14, X=5 and Y=0 or use \*FX14,5 in

```

10 REM PROGRAM III
20 osword = &FFF1
30 program = &900
40 FOR opt=0 TO 2 STEP 2
50 PX = program
60 [OPT opt
70 LDX# time MOD 256
80 LDY# time DIV 256
90 LDA# 3 : JSR osword
100 RTS
110 .time
120 EQU 0
130 EQU 0
140 EQU 0
150 EQU 0
160 EQU 0
170 ]
180 NEXT
190 CLS:VDU23,1,0;0;0;0;
200 CALL program
210 PRINT TAB(5,10)"Interval Timer=";time
220 GOTO200

```

Program III

```

10 REM PROGRAM IV
20 osword = &FFF1
30 program = &900
40 FOR opt=0 TO 2 STEP 2
50 PX = program
60 [OPT opt
70 .interrupt
80 PHA:TXA:PHA:TYA:PHA
90 LDX# sound MOD 256
100 LDY# sound DIV 256
110 LDA# 7 : JSR osword
120 PLA:TAY:PLA:TAX:PLA
130 RTS
140 .sound
150 EQU 1
160 EQU -15
170 EQU 100
180 EQU 30
190 .setup
200 LDX# time MOD 256
210 LDY# time DIV 256
220 LDA# 4 : JSR osword
230 RTS
240 .time
250 EQU &40
260 EQU &F4
270 EQU &FF
280 EQU &FF
290 EQU &FF
300 ]
310 NEXT
320 REM set up interrupt
pointer
330 ?&220 = interrupt MOD
256
340 ?&221 = interrupt DIV
256
350 REM set interval time
r to -30 seconds
360 CALL setup
370 REM enable interval t
imer interrupt event
380 *FX 14,5

```

Program IV

```

10 REM PROGRAM V
20 osword = &FFF1
30 osbyte = &FFF4
40 program = &900
50 FOR opt=0 TO 2 STEP 2
60 PX = program
70 [OPT opt
80 LDA#interrupt MOD 256
: STA &220
90 LDA#interrupt DIV 256
: STA &221
100 LDA# 14 : LDX# 5 : LD
Y# 0 : JSR osbyte \*FX14,5
110 .interrupt
120 PHA:TXA:PHA:TYA:PHA
130 LDX# sound MOD 256
140 LDY# sound DIV 256
150 LDA# 7 : JSR osword
160 \SOUND 1,-15,255,1
170 LDX# time MOD 256
180 LDY# time DIV 256
190 LDA# 4 : JSR osword
200 \ forces the interval
timer to -1 second
210 PLA:TAY:PLA:TAX:PLA
220 RTS
230 .sound
240 EQU 1
250 EQU -15
260 EQU 100
270 EQU 1
280 .time
290 EQU &9C
300 EQU &FF
310 EQU &FF
320 EQU &FF
330 EQU &FF
340 ]
350 NEXT
360 CALL program

```

Program V

```

10 REM PROGRAM VI
20 osbyte = &FFF4
30 osword = &FFF1
40 oswrch = &FFEE
50 DIM program &140
60 FOR opt=0 TO 2 STEP 2
70 PX = program
80 [OPT opt
90 .inputbuffer
100 EQU STRING$(255,CHR$
13)
110 .block
120 EQU inputbuffer MOD
256
130 EQU inputbuffer DIV
256
140 EQU 255
150 EQU 0
160 EQU 255
170 .input
180 LDX# block MOD 256
190 LDY# block DIV 256
200 LDA# 0 : JSR osword
210 BCS escape
220 RTS
230 .escape
240 LDA# 126 : LDX# 0 : L
DY# 0
250 JSR osbyte
260 RTS
270 ]
280 NEXT
290 CALL input
300 PRINT $inputbuffer
310 PRINT $&600

```

Program VI



Basic. To disable the interrupt we use \*FX13,5.

● Set the interval timer so that it reaches zero in the required number of seconds, minutes or hours.

Program IV illustrates these steps – it produces a sound after 30 seconds. The part of the program that is called when the interrupt occurs starts on line 70. It uses another Oword call with A=7 to generate a sound, and its parameter block contains the eight bytes of data required.

The address of the interrupt routine is placed in locations &220 and &221 and the interrupt is activated using \*FX14,5. A short machine code routine is used to set the interval timer to minus 30 seconds, which is a bit like setting a 24 hour clock to 30 seconds to midnight, 11:59:30.

This means that the beep will occur exactly 30 seconds after the program has been run when the timer crosses zero, no matter what the computer is doing – this is the power and value of interrupts.

Program V uses the same interrupt technique to make the computer tick every second. To stop the ticking disable the interrupt using \*FX13,5. To calculate the value to set the interval timer:

```
PRINT*FF*;"-(hours*360000+
minutes*6000+seconds*100)
```

```
10 REM PROGRAM VII
20 osbyte = &FFF4
30 osword = &FFF1
40 oswrch = &FFEE
50 DIM program &140
60 FOR opt=0 TO 2 STEP 2
70 PX = program
80 [OPT opt
90 .inputbuffer
100 EQU STRING$(255,CHR$
13)
110 .block
120 EQU inputbuffer MOD
256
130 EQU inputbuffer DIV
256
140 EQU 5
150 EQU 97
160 EQU 122
170 .input
180 LDX# block MOD 256
190 LDY# block DIV 256
200 LDA# 0 : JSR osword
210 BCS escape
220 RTS
230 .escape
240 LDA# 126 : LDX# 0 : L
DY# 0
250 JSR osbyte
260 RTS
270 ]
280 NEXT
290 CALL input
300 PRINT $inputbuffer
```

Program VII

**‘... this is the power and value of interrupts’**

and place the bytes in reverse order in the parameter block.

The final Oword call with A=0 is used by machine code programmers to input a string from the keyboard. It's the equivalent of Basic's INPUT. Figure II shows the structure of the parameter block.

The parameter block determines the maximum length of the string, the range of characters that are acceptable and the address where the operating system is to store it.

Program VI contains an input routine that can be used in any machine code program. Line 100 reserves 255 bytes of memory for the string and lines 120 to 160 set up the Oword parameter block. Figure II outlines its structure.

After the Oword call has been made the routine checks to see if the Carry flag is set in line 210. This is the operating system's way of telling us that Escape was pressed. If it is set then Escape must be acknowledged with Osbyte 126.

In Program VI the string is stored in *inputbuffer* situated at the start of the machine code program. However the

computer has its own buffer for inputting strings. It's located in page 6 of the memory, from &600 to &6FF.

Lines 300 and 310 of the program print out the contents of that buffer as well as the buffer specified by our program. You can see that they're the same.

You'll actually see three strings – the one you type in, the one the operating system stores at &600 and the one stored by Program VI.

Program VII shows how the inputted characters can be restricted by changing the values in the parameter block.

Only lower case letters are entered into our buffer, but notice that all characters typed are printed on the screen. Try it and you'll see what I mean.

In the parameter block

location XY+3 is set to 97 (Ascii a) and XY+4 is 122 (Ascii z). In addition only five characters can be entered – XY+2 equals 5.

Program VIII shows another use of the input routine. It inputs a string and displays it backwards.

The routine uses the fact that after the input call has been made the Y register contains the value of the length of the string.

After the string has been input a loop is used to print out the string in reverse. Owrch is used to send the character to the screen.

● *That's the end of this series on Oword calls. I hope you find them useful in your endeavours. Good luck with your programming.*

```
10 REM Program VIII
20 osbyte = &FFF4
30 osword = &FFF1
40 oswrch = &FFEE
50 DIM program &140
60 FOR opt=0 TO 2 STEP 2
70 PX = program
80 [OPT opt
90 .inputbuffer
100 EQU STRING$(255,CHR$
13)
110 .block
120 EQU inputbuffer MOD
256
130 EQU inputbuffer DIV
256
140 EQU 255
150 EQU 32
160 EQU 127
170 .input
180 LDX# block MOD 256
190 LDY# block DIV 256
200 LDA# 0 : JSR osword
210 BCS escape
220 RTS
230 .escape
240 LDA# 126 : LDX# 0 : L
DY# 0
250 JSR osbyte
260 RTS
270 \input string
280 \and reverse it
290 .reverse
300 JSR input
310 .loop
320 LDA inputbuffer,Y
330 JSR oswrch
340 CPY# 0 : BEQ rts
350 DEY
360 JMP loop
370 .rts
380 LDA# 10 : JSR oswrch
390 LDA# 13 : JSR oswrch
400 RTS
410 ]
420 NEXT
430 CALL reverse
```

Program VIII



THIS month we'll be leaving behind the functions we got entangled with last time and moving on to a whole new way of programming.

But first let's look at an old, horrible way of programming, in the form of Program I.

```

10 REM Program I
20 PRINT "Enter monthly
income"
30 INPUT monthly
40 IF monthly<200 THEN G
OTO 100 ELSE GOTO 200
100 REM below tax thresho
ld
110 PRINT "Net pay is 'jn
onthly' tax paid is 0"
120 GOTO 300
200 REM tax routine
210 tax=monthly*.1
220 net=monthly-tax
230 PRINT "Net pay is 'jn
et' tax paid is 'tax
240 GOTO 300
300 END
    
```

Program I

By now you should be well aware of my prejudice against GOTOs. They should be avoided at all costs.

Still, in Program I they're not too bad: It's fairly easy to see what's happening. Which, to be honest, is very little!

All the program does is to ask you how much you earn per month and store it in the variable *monthly*. Line 40 then tests *monthly* to see if it is less than 200 (in which case no tax has to be paid).

If this is so, the program jumps to line 100. Otherwise it goes to line 200.

Suppose that *monthly* had the value 100. In this case it's true that *monthly* is less than 200, so the program immediately moves to line 100.

This is just a REM hinting at what the next few lines are going to do. In fact, they don't do much. Line 110 just tells you your net pay and the fact that you pay no tax.

The next line is more interesting. Its GOTO has the program going to line 300 which is the END that ends the program.

Now if *monthly* was 200 or

over, say 300, then the test of line 40 would fail and the part after the ELSE would be performed.

This sends the program to line 200 which is the start of a section of code that works out the tax paid and the net pay.

There's nothing difficult in either the coding or the maths, although the tax rate is sadly far from realistic.

At the end of that line 240 tells the program to GOTO line 300, the end again.

This last GOTO isn't really necessary, as the program would have come to line 300 anyway. However it's good practice to put it in, to keep things tidy and allow easier modification of the program at a later date.

It helps to have all the loose ends of a program gathered up at a single END.

Notice the way that the IF of line 40 chooses between two sections of code.

Also see how the two bits of code are completely separate. I've highlighted this by using line numbers starting at 100 and 200 for each section.

When the program is run, only one of these bits of code is performed, the GOTOs being used to leap over the unused lines. Figure 1 shows the program's flow of control diagrammatically.

This idea of having separate sections of a program doing separate things is extremely important, as you'll find when you come to write more complicated, practical pro-

grams of your own.

As we'll see, they make it much easier to write, correct and alter programs. And to be fairly confident that they will work.

The trouble is the GOTOs

are messy and in a long program they get messier.

What we need are subroutines. Program II has an example of one of these in use.

Looking at lines 10 to 60 the program seems fairly

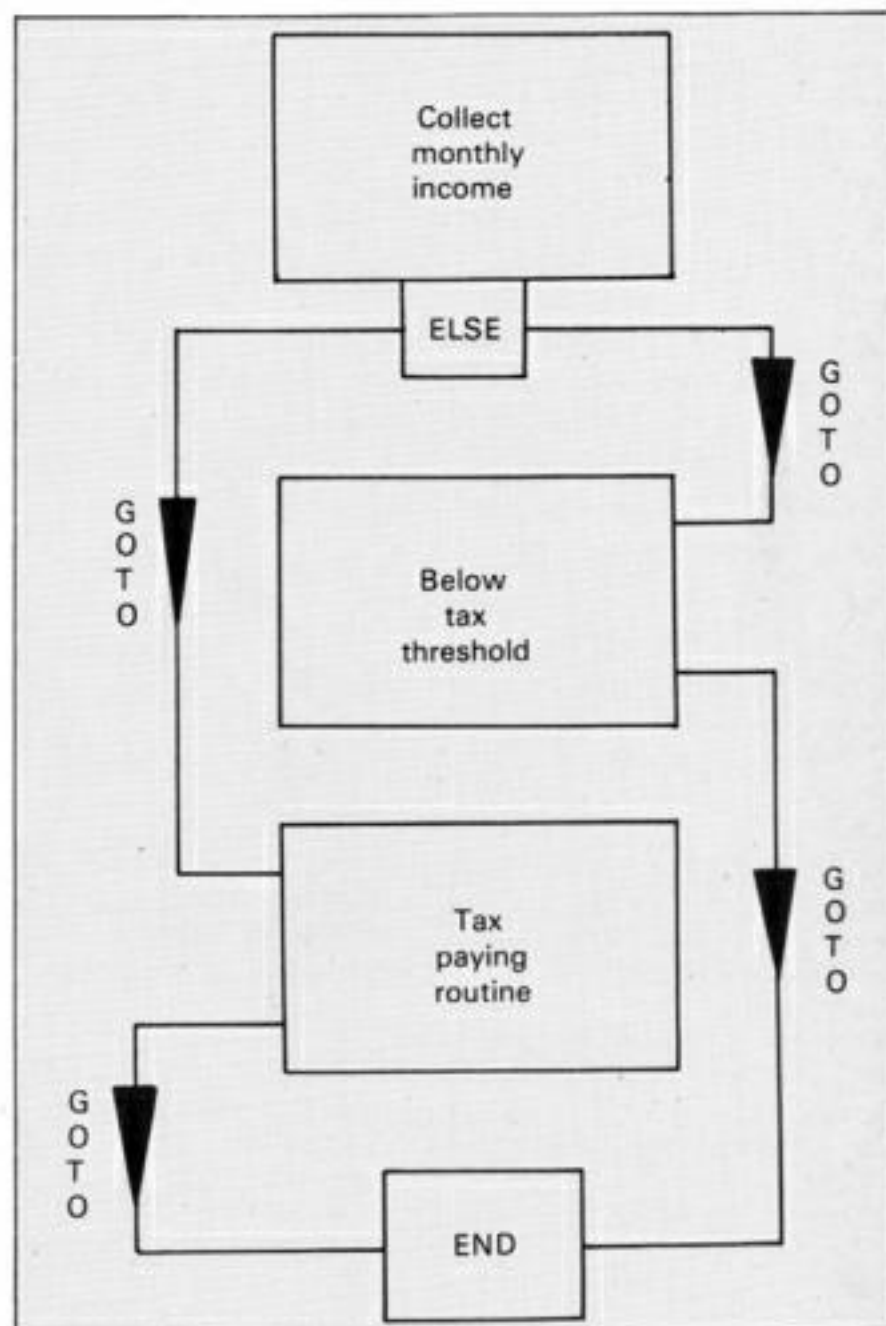


Figure 1: Flow of control for Program I



```

10 REM Program II
20 PRINT "Give me a number"
30 INPUT number
40 GOSUB 100
50 PRINT "The square of
;number" is ";square
60 END
100 REM squaring routine
110 square=number*number
120 RETURN

```

Program II

straightforward. It takes a number from the keyboard and stores it in *number*.

Line 50 obviously prints out the value of *number* squared, and line 60 brings things to a halt. But what is this GOSUB 100 in line 40?

GOSUB tells the micro that it is to go to a section of code beginning at the line specified (in this case 100) and perform that. This code is known as a subroutine.

In this case the Electron obeys line 40 and goes to the subroutine starting at line 100. This is just a REM labelling the subroutine.

Take my advice, and always use a REM or two to explain what the subroutine does – or what you hope it does! It saves a lot of time, trouble and torment when you come to correcting or debugging faulty programs.

Once the program has entered the subroutine at line 100 it carries on as normal, going from line to line.

In this case it ignores the REM and goes on to calculate the square of *number*, storing it in *square*.

The next line contains another new keyword, RETURN. This does two things. First of all it marks the end of the subroutine (notice that there's nothing to show the start of a subroutine, hence the use of a REM).

It does more than that however: It also tells the micro to go back to the line that follows the one that called the subroutine, that is, the line after the original GOSUB.

In this case it was line 40 that sent the program hurtling off to the subroutine starting at line 100, so the RETURN of

line 120 sends the program back to line 50.

The micro then carries on as normal, going from line to line.

Line 50 just displays the value of *square* and the next line, 60, ends the program.

If you like, you can look on the subroutine as a little program in its own right.

In Program II we only had one simple assignment statement before the micro came across the RETURN that ended the subroutine.

In fact you can have all the normal Basic commands in a subroutine. So you can have loops, IF statements and even subroutines.

More of this later on. The point to grasp is that GOSUB allows us to use a section of code without all the messiness we'd meet if we tried doing it with GOTOs.

A closer look at Program II produces a bit of a puzzle. After all, the END of line 60 brings things to a halt. So how does the program get to use lines 100 to 120 which come after the END?

The answer lies in the fact that the GOSUB that accesses the routine comes before the END. As this sends the program off to the code beginning at line 100, the END is jumped over.

It's rather like the way the GOTOs leapt over code in Program I. At the end of the subroutine, the program goes back to line 50 and then meets the END of line 60.

And this END has to be there. Try leaving it out and see what happens.

You get:

**No GOSUB at line 120**

What has happened is that the program has performed as before, calling the subroutine and then RETURNing to the line after it and carrying on from there.

Only now the END is missing. The program carries on undaunted and gets on with executing lines 100 and 110. So far so good.

But what does the poor Electron do with the RETURN of line 120?

Normally when it meets a GOSUB the micro keeps a

```

10 REM Program III
20 PRINT "Enter monthly
income"
30 INPUT monthly
40 IF monthly<200 THEN G
OSUB 100 ELSE GOSUB 200
50 END
100 REM below tax thresho
ld
110 PRINT "Net pay is ";m
onthly" tax paid is 0"
120 RETURN
200 REM tax routine
210 tax=monthly*0.1
220 net=monthly-tax
230 PRINT "Net pay is ";n
et" tax paid is "tax
240 RETURN

```

Program III

note of the following line number so it knows where to go back to when it meets RETURN. The GOSUBs and RETURNS are neatly paired.

Except, that is, at line 120 where the program now comes across a RETURN without having a matching GOSUB, and hence no place to return to.

The result is the computer gives up and an error message is issued.

So the rule is tuck your subroutines away after an END. You can look on these subroutines at the end of the program as similar to the appendices of a book. When the program comes across a GOSUB it refers to these subroutines to find out what to

do. After this brief diversion it carries on with the main program. Figure II shows the flow of control in Program II.

Program III is a version of Program I. This time it uses the much superior subroutines rather than the horrible GOTOs.

The first three lines do the same job as before, but line 40 has changed. It now chooses between two subroutines, rather than two sections of code insulated from each other by a series of GOTO-inspired jumps.

The code in these two subroutines is just the same as before, except that now they are tucked away after the END

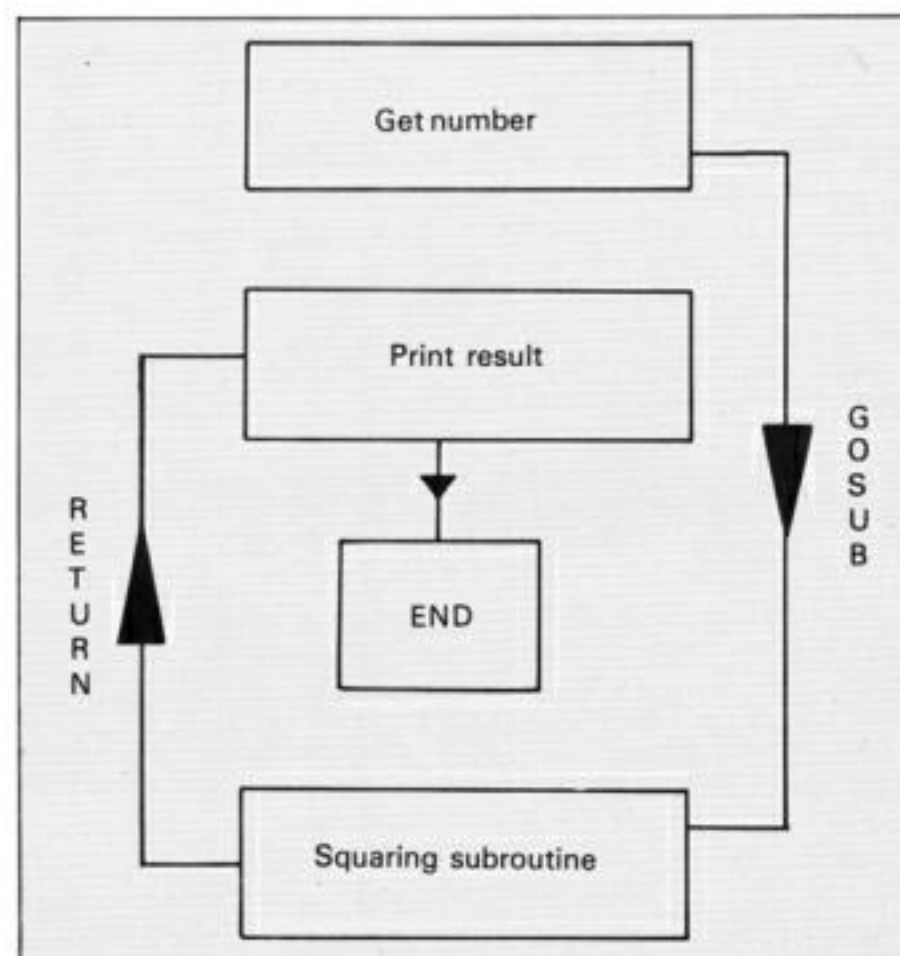


Figure II: Flow of control for Program II



# Beginners

## From Page 45

of line 50 and they are both terminated with RETURN.

In this case it makes little or no difference whether we use subroutines or not. The code is practically the same, although I think you'll agree that once you know about subroutines, Program III is easier to follow.

So subroutines make programs simpler. They can also save a lot of typing.

Very often programs use the same bits of code over and over again with only minor differences. A games program might calculate the score after every screen, the only difference in the sums being the actual bonus per screen held in, say, the numeric variable *bonus*.

It's much easier to have just one scoring subroutine and call it with the appropriate value of *bonus*, rather than copy out all the lines of the scoring routine each time you want to use it.

And subroutines not only simplify programs and save typing time, they also make it much easier to alter them.

Suppose that the tax laws suddenly changed, and instead of being taxed at 10 per cent it becomes 20 per cent.

In Program I we have to search through the listing, find the appropriate line and change it. In Program III we can go straight to the "tax routine" subroutine and modify that in the light of the new rate.

In fact, we could change all the code in that subroutine, adding new lines and the program would still work. We could "plug in" an entirely new routine as needed without having to worry about the rest of the program.

In the longer, more practical programs that you'll soon be writing, this ability to modify programs by changing the subroutines makes life a lot easier. But before you start creating an epic listing have a look at Program IV.

It consists of just two subroutines. The first, lines 100 to 130, simply asks for the user's age and stores it in

```
10 REM Program IV
20 GOSUB 100:REM get the
age
30 GOSUB 200:REM give th
e message
40 END
100 REM collects age
110 PRINT "How old are yo
u"
120 INPUT age
130 RETURN
200 REM displays message
210 IF age<0 THEN PRINT "
```

Program IV

age. The second, lines 200 to 260, prints out an appropriate message if the right age is entered.

Notice how the subroutines begin with an explanatory REM and each start on a line number which is a multiple of 100, making them easy to find.

The program itself is desperately simple, but it does show a couple of things. Look how short the main program is. It's only four lines long and one of those is a REM and another the END!

Really, only two lines are doing the work, the two that call the subroutines. Yet in those two lines the whole structure of the program is shown clearly. Of course, the REMs help. (Moral: if in doubt,

```
Liar"
220 IF age>0 AND age<5 TH
EN PRINT "You learnt to rea
d early"
230 IF age<18 THEN PRINT
"You can't vote"
240 IF age=21 THEN PRINT
"Ever been kissed?"
250 IF age=40 THEN PRINT
"Your life is beginning aga
in"
260 RETURN
```

stick a REM there.)

I said earlier that subroutines could be looked on as mini-programs. They can have IF statements and loops and all the normal structures. They can even call subroutines as Program V, which does the same job as Program IV, demonstrates.

The big change comes in the subroutine formed by lines 200 to 260. Here, instead of a simple PRINT after the IF, another subroutine is called.

These new subroutines are listed from lines 300 to 710. I haven't put in the normal opening REMs as I think the PRINT statements document them fully.

Of course it's a trivial example but suppose that these sub-subroutines were

```
10 REM Program V
20 GOSUB 100
30 GOSUB 200
40 END
100 REM collects age
110 PRINT "How old are yo
u"
120 INPUT age
130 RETURN
200 REM displays message
210 IF age<0 THEN GOSUB 3
00
220 IF age>0 AND age<5 TH
EN GOSUB 400
230 IF age<18 THEN GOSUB
500
240 IF age=21 THEN GOSUB
600
250 IF age=40 THEN PRINT
"Your life is beginning aga
in"
260 RETURN
300 PRINT "Liar"
310 RETURN
400 PRINT "You learnt to
read early"
410 RETURN
500 PRINT "You can't vote
"
510 RETURN
600 PRINT "Ever been kiss
ed?"
610 RETURN
700 PRINT "Your life is b
eginning again"
710 RETURN
```

Program V

more useful than just a silly message.

They might, in fact, be routines to work out age-related benefits. So if you are between 0 and 5 years of age, the subroutine at 400 might contain all sorts of child welfare information and calculations. It might even call other subroutines.

But more of that next month. For the moment just grasp that like big fleas have little fleas, so subroutines can call subroutines.

But before you get the itch to write a few subroutines yourself have a look at Program VI.

```
10 REM Program VI
20 firstRoutine=100
30 secondRoutine=200
40 GOSUB firstRoutine
50 GOSUB secondRoutine
60 END
100 REM first routine
110 PRINT "first routine"
120 RETURN
200 REM second routine
210 PRINT "second routine"
220 RETURN
```

Program VI

While it hardly pushes back the frontiers of Electron programming, it does show one important technique.

Notice how the GOSUBs of lines 40 and 50 are followed by variable names instead of the usual numbers.

The line numbers have been stored in *firstRoutine* and *secondRoutine* in lines 20 and 30. This makes the program much clearer to read and understand. Programs with lines like:

```
100 GOSUB calculateTax
```

or:

```
200 GOSUB zapAlien
```

are almost self-documenting.

Unfortunately though, the RENUMBER command doesn't take them into account so they aren't too practical.

● On which note we'll finish for this month. Next time we'll have a look at subroutines in greater detail and see how they can help us plan our programs.



# Micro Messages

## Viewstore for those really big databases

I HAVE a Cumana disc system and wanted to use the spare ROM socket for a good disc-based database.

After much difficulty in getting answers as far as compatibility is concerned I decided to risk buying Viewstore in the hope that it would work.

It did so perfectly. It is rather slow, as is a lot of BBC software run on the Electron, but it allows Electron users to handle extremely large databases.

It passes information to View (ROM cartridge) for mail merging perfectly. Among other things I now use Viewstore for cataloguing my collections of books, cassettes and records.

As you know the Electron does not have the same function keys as the BBC Micro. After trial and error I discovered that the Electron's commands were as below:

Key	Function
1	Record Format
2	Change Display
3	Delete End of Record
4	Beginning of Field
5	End of Field
6	Index Field
7	Locate
8	Insert Character
9	Delete Character
0	Data
A	Card Layout
B	Database Header
C	Cursor Lock
J	Delete Record
M	Beginning of Record
N	End of Record
O	Down one Screen
P	Up one Screen
.	End of File
/	Beginning of File
-	Forward one Character
,	Back one Character

Because the Cumana disc system should not get 'Can't Extend' errors it is not necessary to state the space required on the disc when setting up a database.

I see no reason why Viewstore should not work for Plus 3 users as well, providing they have something like a ROM adapter for a Plus 1

Cartridge or a Slogger ROM Box.

Finally could you tell me if the Slogger Turbo-driver might speed up Viewstore by making disc accessing faster?

Would this make my Electron any more unreliable? It tends to crash occasionally for no apparent reason - I put this down to its heavy work load. -

**Stephen W. Domleo, Umberleigh, N. Devon.**

● The Turbo-driver will speed up your Electron, but the disc system will be pretty much the same.

If you use Modes 0 to 3 you'll find that screen operations and calculations are much faster.

We haven't had any reports of unreliable Turbo Electrons so it's probably safe to assume that it can cope with the extra speed.

### Map of the Citadel

I BOUGHT Citadel for my Electron a month ago and I haven't yet finished it.

It would be a great help if you could print a plan of all the rooms and places in your mag.

- **Michael Hughes, Gres-**

**ford, Clwyd.**

● Can anyone help Michael with a map for Citadel?

### More tips

I WOULD like to add to Tim Walter's tips on Citadel. Firstly he mentioned that to get the crystal in the central tower you must jump from the top of the East tower to pull the lever and hence lose a lot of energy.

This is not so. To pull the lever collect the bucket and fill it with water from the cellar.

Take the bucket with the water in to the East fireplace and put the fire out. Then climb up the chimney and you will be able to get to the lever.

Tim did not mention where to put the crystals. Take them to the temple and drop them where the trampoline is. The crystal will disappear and be placed in the sanctuary.

When you have all five crystals in the sanctuary stand on one of the pads in the room to the right of the sanctuary. You will be transported to the palace.

Here you must collect the bejewelled figurine and return to the temple the same way as you came.

You will then have de-

stroyed the teleport system, and if you have 99 points you become ruler of Citadel.

To get 99 points you need the three crowns which are in the following three places:

● Down the bottom of the well - drop the ice crystal at the bottom of the well so you can enter the room to your right where there is a crown.

● In the witch's house - when you get into the witch's house through the chimney and have killed the monk jump into the wall above the ladder.

There you will find a secret passage leading to a room with a crown in it.

● In the cellar - drop the trampoline or barrel where the key is. You will then be able to jump into a secret passage in the roof and walk into a room containing the last crown.

One final point - people may be having trouble with lack of energy.

To help overcome this it is useful to take the blue blocks to Stonehenge, where they will be transformed into 30 or 40 energy units. - **D. Waterhouse, Hinckley, Leicester.**

### ... and more

THE Key to the Citadel letter in the May 1986 issue of Electron User misinforms people of the correct way to get the fourth crystal.

To put the switch on at the blue wall all that is needed is the green bucket filled with water off the beach to put the flames out at the east fireplace.

Once out there is a passage up the back of the fireplace up to the blue wall at the top.

To get past the monk go part way down the passage and he will stick in the hole and can be easily shot with a spell. - **Paul S. Leech, Seascale, Cumbria.**

ALL programs printed in this issue are exact reproductions of listings taken from running programs which have been thoroughly tested.

However, on the very rare occasions that mistakes may occur corrections will be published as a matter of urgency. Should you encounter error messages when you type in a program

they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.



## Those trying programs . . .

I ENJOY reading Merlin's Cave and Micro Messages. I also like previews for games and advertisements.

My only problem is that whenever I try a program from the magazine they do not work! — **Brian Marum, Ealing.**

● Typing in listings from the magazine might seem easy, but getting them to run afterwards can be much more difficult.

When you have finished entering a program go through it very carefully, line by line, looking for simple typing errors.

Even experts can't type in a listing without making at least one error and usually there are several.

Rest assured that all our listings have been thoroughly checked and if any errors do slip through — a rare occurrence — you'll find the corrections in Micro Messages. Our eagle-eyed readers don't miss much!

## Reader's choice

THANKS for a great magazine. I especially like Merlin's Cave and the new graphics series by Trevor Roberts — this really shows what can be achieved on an Electron.

How's about seeing a few software specials on games with a particular theme, such as unarmed combat, aircraft, football and so on?

I would also like to see the return of the Top Ten, as this gives a good idea of which games to buy and which ones to avoid. — **Munro Drive, Edinburgh.**

## Tricky problem

IF anybody were to write to Acorn saying that they were thinking of buying a computer and could they have details of the Electron that information would be despatched by return of post free of charge.

However having sold the

**WHAT** would you like to see in future issues of Electron User?

What tips have you picked up that could help other readers?

Here is your opportunity to share your experiences.

Remember that these are the pages that you write yourselves. So

tear yourself away from your Electron keyboard and drop us a line. And please, if you want a reply, enclose an SAE.

The address is:

Micro Messages  
Electron User  
Europa House  
68 Chester Road  
Hazel Grove  
Stockport SK7 5NY.

Electron Acorn no longer want to know you. In my opinion they act disgracefully toward Electron owners.

Last March I wrote to Acorn Technical Enquiries Dept. at Cambridge, enclosing a first class SAE. My letter of inquiry has been completely ignored.

As a pensioner I can ill-afford to waste postage stamps and envelopes. Could it be that Acorn are in such dire straits that they resort to steaming off postage stamps to reuse themselves?

If you publish this letter it may at least shame them into refunding the 34p I have wasted.

In view of the fierce competition in the computer industry it is strange that firms can be so indifferent and dilatory.

My simple inquiry to Acorn was requesting a foolproof method of preventing program listing. In June 1985 Electron User you published a method in response to a reader's request, but I found I could break it.

However there must be a system, as proved by Mini Office and other commercial tapes. — **J. Rayner, Mansfield, Notts.**

● You may have made a simple request but the solution is far from simple.

Simple protection systems are simple to break into — you'll find such a system in Micro Messages in our June 1986 issue.

Software companies employ protection experts — programmers who specialise in protection systems.

These programmers can provide you with a system that will foil 99.99 per cent of all pirates and hackers, but they aren't cheap and will provide you with a hefty bill.

## Lost for words

I HAVE just bought Commando by Elite for my Electron. It's not a bad game but why is it so slow?

In the April edition of Electron User you said that Superior Software were producing Speech! for the Electron.

A friend immediately placed an advanced order for Speech!, but in the May edition you said that they were not bringing it out. Which statement is true? — **Darren Wray, Ryde, Isle of Wight.**

● The Electron version of Commando is quite slow at times. Owners of Slogger's Turbo Driver will find it a fast and exciting game to play.

Superior Software at first thought that it may be possible to convert Speech to the Electron, but had to abandon it as they found it impossible.

## Teletext adapter

IN your October 1984 issue it was mentioned that Sir Computers of Cardiff had brought out a Mode 7 adapter for the Electron.

However on inquiring at a local computer shop I was told that they had gone bust.

In the May 1986 issue you said that Morley Electronics have brought out a teletext adapter for use with the Electron with built in Mode 7.

Are there any other firms which produce a Mode 7 adapter? If not, are there likely to be any companies doing so in the near future? — **Chris**

**Willis, Choppington, Northumberland.**

● The Morley teletext adapter is the only one available for the Electron, and we haven't heard of any other companies planning to produce one.

## Circle of triangles

I FOUND Trevor Robert's Circle of Triangles program in the March 1986 Notebook interesting but not very efficient.

After all, when you've added the extra lines to make it loop five times the program calculates the x and y coordinates for every loop.

Why not, I asked myself, just calculate all the values of x and y once and for all, storing them in an array? Then the program can just reference these values from the loop instead of having to calculate them anew each time round. The result is the enclosed program:

```
10 REM CIRCLE OF TRIANGLES
20 REM TREVOR ROBERTS
30 MODE 0
40 DIM X(24),Y(24)
50 VDU 29,640,512;
60 GCOL 3,3
70 degree=0
80 FOR loop=1 TO 24
90 angle=RAD(degree)
100 X(loop)=200*SIN(angle)
110 Y(loop)=200*COS(angle)
120 degree=degree+15
130 NEXT loop
140 FOR outer=1 TO 5
150 FOR inner=1 TO 24
160 x=X(inner):y=Y(inner)
170 PROCtriangle(x,y)
180 NEXT inner
190 NEXT outer
200 END
210 DEF PROCtriangle(x,y)
220 MOVE x,y
230 PLOT 1, 50,50
240 PLOT 1,50,-50
250 PLOT 1,-100,0
260 ENDPROC
```

It is much faster than the earlier one. — **Guy Wicker, Sheffield.**

● Trevor says that you're right,



the program is a lot better your way.

He points out in mitigation that he only had a limited amount of space to explain the original listing without going into arrays.

## Screen dump

DO you know of a suitable screen dump for the Epson MX-80 dot matrix printer as the one in the March 1985 issue doesn't work with my printer. — **Stuart Toller, Thornbury, Bristol.**

● You must have made a typing error. Actually you'll find an excellent dump suitable for Shinwa and Epson printers in the June 1986 issue of *Electron User*.

## Listing Sphinx

HERE is a method for listing Sphinx Adventure by Paul Fellows without the need for a bad program fixer:

CHAIN Sphinx as usual. When it has loaded crash the program by typing GO RENUMBER RENUMBER RENUMBER RENUMBER . . . ., by holding down the Function key and B until you hear the string-too-long beep.

Press Return and then enter:

```
!TOP=&FF8D
```

Finally LIST as usual. — **David Patrick, Neilston, Glasgow.**

## Electron's OS

WHAT OS has the present Electron got? If it is 1.2 is it possible to upgrade from OS 1.0 to OS 1.2?

I got my computer about 19 months ago and I have an OS of 1.0. — **E.A. Pearson, Ipswich, Suffolk.**

● There is only one version of the Electron's operating system — 1.0. This is equivalent to the BBC Micro's OS 1.2.

# Keeping track of memory

CAN you help me with a few minor problems on my Electron?

Firstly I bought Mini Office which I find invaluable. However I have a problem with the spreadsheet program.

If I type in a lot of figures and formulae I occasionally get an error message saying 'no room at . . .' at which point the program breaks and I cannot retrieve the inputted data.

Is there any way of avoiding this by finding out how much memory is left, or by retrieving the information?

Secondly since I have got a Plus 1 interface I sometimes get the error message 'EVALEND' displayed when loading recorded tapes. What does it mean and what is its effect on the computer?

I cannot find any reference

to it in my manual or in the booklet supplied with the Plus 1.

Thirdly I have bought a Brother HR-5 thermal transfer printer and the problem is getting the in-built functions to work.

In the manual the instructions say LPRINT or PRINT 1 but these do not work on my Electron and error messages are displayed.

Also is there a screen dump program for this printer, or does the Epson screen dump work on it?

Finally I am stuck on Sphinx. I can get as far as the serpent but, despite trying to set fire to something I still cannot get out. What is it I set fire to, and what command do I use?

The only way I have found of getting out is to rub the ring

but that only lands back in the sorcerer's lair. — **David J. Meleleu, Wellingborough, Northants.**

● Unfortunately there's no indication of the amount of memory left, so stick to small numbers of figures and simple formulae.

If memory is a problem then you need a ROM-based spreadsheet, such as Viewsheet from Acornsoft. This will set you back about £25.

We've never had the error message you describe so we're stumped. Can anyone help?

Have a look at Micro Messages, May 1986 for help with your printer.

The January 1986 issue of *Electron User* contained a special on Sphinx with a complete solution.

## Disc filing system

MY son and I decided to get a disc filing system for our Electron and we opted for Solidisk's EFS interface and a disc drive with PSU.

However three interfaces later, we are back to square one. Each arrived without a protective cover and was unworkable.

We have had no better luck with the disc drive. We sent off to Viglen for one with PSU, but were told that there had been an error in the advert and the price was in fact higher than stated.

We then decided to order one we could afford from Watford Electronics, but again we found the price had risen.

Surely these companies should have more reliable marketing strategies. They seem to advertise goods which they don't have in stock and for which they can't guarantee a price.

Can you recommend a reliable company which will provide a workable system at an acceptable price. We are not interested in the Plus 3 or the Cumana. — **C. Wood,**

**Howden, Livingston.**

● If you've tried the Solidisk interface and you're not interested in the Plus 3 or Cumana interface, that only leaves Advanced Computer Products Plus 4 disc interface. This was reviewed in the June 1986 issue of *Electron User*.

It is an excellent interface and is the one we use in the office. ACP can also supply a suitable drive.

## Compatible

WE have a regular subscription to *Electron User* but we no longer have an Electron, only BBC B with an Econet system.

Could you tell me which games listings are fully compatible with the Electron and BBC Micro?

Fruit Worm from the January 1986 issue will not run, even after removing any obvious bugs. — **F. Scoote, Mayfield Middle School, Ryde.**

● Not all *Electron User* listings run on the BBC Micro. Basically the simpler the program the greater the chance of it working.

Fruit Worm is a complicated machine code program which isn't compatible

with the BBC Micro.

However the author has converted it to run on it and *The Micro User* will be publishing it shortly.

## Incompatible

I HAVE reached the tenth Dan in *The Way Of The Exploding Fist* by Melbourne House.

When I completed it the game just carried on at the same level which was a bit disappointing.

The way to beat the harder opponents is to jump over them and jump back quickly so that they have their backs to you.

Then you can kick or punch them. You must be careful though that you jump back quickly or you will be hit.

My high score on *Fist* is 71,900. I think it is the best game on the Electron but I can't get it to work on joystick.

I have a First Byte joystick interface. Can you help? — **Andrew Hagan, Hornchurch, Essex.**

● We've had a few letters saying that *Exploding Fist* doesn't work with joysticks plus First Byte interface. It sounds like the two aren't compatible.



# Listings galore!

Save yourself the chore of typing in listings by sending for our monthly tapes, packed with games, utilities, graphics and other programs from the pages of *Electron User*.

ONLY  
£3.75  
each

## On the July 1986 tape:

**ROYAL WEDDING** Celebrate the royal event with our ingenious sliding block puzzle. **SNAPDRAGON** Two player version of the classic card game. **ATTRIBUTES** Colourful two player strategy game. **FORMATTER** Make your listings easier to read. **DISCS** Extended star commands. **EXTRA COMMANDS A WHILE** ... WEND command for your micro. **PLUS** superb digitised picture of Andrew and Sarah.

## On the June 1986 tape:

**FISHING** Enjoy a quiet day by the river, and maybe catch your tea as well! **TACTICAL PURSUIT** A two player strategy game played with pawns on a chess board. **MINIBASE** Create an electronic telephone directory. **EXTRA COMMANDS** Add more commands to Basic. **SCREEN DUMP** Multi-tone screens dumps for Epson compatible printers.

## On the May 1986 tape:

**MISSILE JAMMER** Defend the city of Pezina from a missile invasion. **VECTOR LETTERS** Use \*LINE to create double height text. **DEGREES** Convert from Centigrade to Fahrenheit and vice-versa. **CROCODILE TEARS** Spell well or end up as a crocodile's dinner. **ZAP** Blast the marauding aliens. **EXTRA COMMANDS** Adding new keywords to Basic.

## On the April 1986 tape:

**INVASION FORCE** Exciting zap 'em space game. **EASTER EGG HUNT** Seasonal game using compass points. **BACH TO BASICS** Music tutor. **NOTICE BOARD** Text scrolling utility. **SEARCH and RECOVER** Two routines from the disc article. **NOTEBOOK** Recursion backwards.

## On the March 1986 tape:

**GRAND PRIX** Exciting race game. **DICER** A clever test of strategy. **MARCHING ORDER** Counting and ordering numbers. **FIND AND REPLACE** Useful editing program. **SECTOR EDITOR** Excellent disc utility. **TIMEPIECE** Superb graphics demonstration. **OXO** Game of cunning. **TRICIRC** A circle of triangles.

## On the February 1986 tape:

**NECROMANCER** Superb text adventure. **GREBIT** Arcade action. **FAST BACKUP** Disc utility. **MACHINE CODE** How to write an arcade game. **TAPEDISC** More software transferring techniques. **SEAWAYS RAM** Example program.

## On the January 1986 tape:

**FRUIT WORM** An arcade classic. **HELICOPTER RESCUE** Pilot an air sea rescue helicopter. **MACHINE**

**CODE** Detect collisions between sprites. **TAPEDISC** Transfer your software to disc. **MODE012** Multi-Mode screens.

## On the December 1985 tape:

**GET SET SANTA** Christmas fun collecting presents. **MISSILE ATTACK** Save your cities! **PROGRAM PROBE** Using joysticks. **SPACE COUNT** Counting for youngsters. **CHRISTMAS CARD** Cards and carols for all. **DISC MENU** Disc Menu creator.

## On the November 1985 tape:

**KARATE WARRIOR** Electrifying combat. **ULA Mode 6 Mode 7!** **PAINT ROLLER** Colourful arcade action. **DEFUSE** Beware the bombs. **SPRITE PRINT** Machine code graphics utility. **TRAIN** Far from stationery graphics.

## On the October 1985 tape:

**DUNGEON QUEST** An amazing all action arcade adventure. **PILOT** Computer assisted learning language. **RAVING ROLLER** Arcade action in the garden. **TRAIN** Animated action. **KALEIDOSCOPE** Colourful graphics action.

## On the September 1985 tape:

**TEXNDAN** 3D Wild West shootout. **PINTCURSOR** Machine code graphics. **SPRITE/ED** Sprite editor. **COMPOSE** Writing music simplified. **REVERSI** Cunning strategy game. **SIMPLEFILE** Save and read data. **BOUNCE BALL** Two player action. **ROTATE** Animation in a spin.

## On the August 1985 tape:

**DIGGA** Exciting arcade action beneath the earth. **DODGE THE ASTEROIDS** Fun deep in space among the asteroids. **M/CODE GRAPHICS** Sliding pints of beer! **\*FX** The OS explored. **MOVEIT** An intriguing sliding puzzle. **HEXGRAM** An educational game to increase your word power.

## On the July 1985 tape:

**MANIC MOLE** Machine code action at its best. **HIGHER OR LOWER** Guess the card. **TIME BOMB** Carefully collect TNT. **M/CODE GRAPHICS** Two demonstrations. **FX1/2** The OS on call. **PIRATE MATHS** Sum fun. **NOTEBOOK** Password Generator.

## On the June 1985 tape:

**QUASIMODO** Bellringing classic. **DISASSEMBLER** Machine code utility. **ACTIVITIES** Educational fun. **REFLECT** Aggressive aliens. **ENGINE** Animation. **DODGE** Race track action. **STRINGALONG** Scrolling fun. **CASTLE** Medieval graphics. **MATHS CURVE** Angles and art. **NOTEBOOK** Trees.

## On the May 1985 tape:

**SKRAMBLE!** Compulsive arcade action. **SHEEPNIM** The logic game.

**TEXTWRITER** Screen utility. **LIFE** A cultured classic. **CEDRIC** Educational fun. **THREE-D** Outstanding utility. **SPOKES** Fascinating graphics. **MOONORBIT** Heavenly displays. **BLAZON** Heraldic devices. **FLOWERS** A Basic bouquet. **NOTEBOOK** Annotated animation.

## On the April 1985 tape:

**SUPER ARCHER** Target practice. **BINARY SEARCH** Search data efficiently. **JOYPLUS** Switched joystick routine. **ODD ONE OUT** Educational fun. **POLYGONS** 3D rotation. **MONEY CRAZY** Arcade action. **STARCHART** The night sky. **FORTUNE TELLER** Horoscope. **COLLISION DETECTION** Alien encounters. **HILO** Guessing game. **NOTEBOOK** Hello to assembler.

## On the March 1985 tape:

**MR. FREEZE** Ice cube arcade action. **SCREENDUMP** Two procedures for printer dumps. **FILLER** The machine code fill routine. **FRED'S WORD GAME** Educational fun. **BIG LETTERS** Large text utility. **PERCY** Beat the burning fuse. **ANIMATION** Two example programs. **PIGS** Frying bacon. **NOTEBOOK** Display formatting.

## On the February 1985 tape:

**CRAAL** The mystifying maze adventure. **BOUNCY** Addictively annoying action. **PAIRS** Can you remember the cards? **BASE A** Binary/hexadecimal conversion utility. **CATCHER** Collect the eggs before they break. **CLOCK** Time-keeping utility. **RACER** Grand Prix action. **NOTEBOOK** Graphics windows. **TRIG** All the right angles.

## On the January 1985 tape:

**SPACE BATTLE** Destroy the deadly descending aliens! **NEW YEAR** A sound and graphics greeting. **ESCAPE FROM SCARGOV** Minefield action. **PIE CHART** Statistics made simple. **CLAYPIGEON** An Electron birdshoot. **ORGAN** Music maestro please! **NOTEBOOK** An original program. **RANDOM NUMBERS** Or not so random! **SNAKES** Reptilian arcade action. **CHEESE RACE** Beat rival mice.

## On the December 1984 tape:

**CHRISTMAS BOX** Align the presents logically. **SILLY SANTA** Sort out the muddle. **SNAP** Match the Xmas pictures. **RECOVERY** The Bad Program message tamed. **CAROL** Interrupt driven music. **AUTODATA** A program that grows and grows. **NOTEBOOK** Simple string handling.

## On the November 1984 tape:

**STAR FIGHTER** Anti-alien missions. **SCROLLER** Wrap around machine code. **URBAN SPRAWL** Environmental action game. **SPELL** Alphabetic education. **JUMPER** Level headed action. **CAESAR** Code breaking broken. **KEYBOARD** Typing game.

## On the October 1984 tape:

**BREAKFREE** Classic arcade action. **ALPHASWAP** A logic game to strain your brain. **SOUND GENERATOR** Tame the Electron's sound channels. **MULTICHARACTER GENERATOR** Complex characters made simple. **RIGEL 5** Out of this world graphics. **MAYDAY** Help with your morse code. **NOTEBOOK** Palindromes and string handling.

## On the September 1984 tape:

**HAUNTED HOUSE** Arcade action in the spirit world. **SPLASH** A logic

game for non-swimmers. **SORT SHOWS** How sorting algorithms work. **SORT TIME** The time they take. **CLASSROOM INVADERS** Multicoloured characters go to school. **SAILOR** Nautical antics. **MATHS TEST** Try out your mental powers.

## On the August 1984 tape:

**SANDCASTLE** The Electron seaside outing. **KNOCKOUT** Bouncing balls batter brick walls. **PARACHUTE** Keep the skydivers dry. **LETTERS** Large letters for your screen. **SUPER-SPELL** Test your spelling. **ON YOUR BIKE** Pedal power comes to your Electron. **SCROLLER** Sliced strings slide sideways.

## On the July 1984 tape:

**GOLF** A day on the links with your Electron. **SOLITAIRE** The classic solo logic game. **TALL LETTERS** Large characters made simple. **BANK ACCOUNT** Keep track of your money. **CHARTIST** 3D graphs. **FORMULAE** Areas, volumes and angles.

## On the June 1984 tape:

**MONEY MAZE** Avoid the ghosts to get the cash. **CODE BREAKER** A mastermind is needed to crack the code. **ALIEN** See little green men - the Electron way! **SETUP** Colour commands without tears. **CRYSTALS** Beautiful graphics. **LASER SHOOT OUT** An intergalactic shooting gallery. **SMILER** Have a nice day!

## On the May 1984 tape:

**RALLY DRIVER** High speed car control. **SPACE PODS** More aliens to annihilate. **CODER** Secret messages made simple. **FRUIT MACHINE** Spin the wheels to win. **CHASER** Avoid your opponent to survive. **TIC-TAC-TOE** Electron noughts and crosses. **ELECTRON DRAUGHTSMAN** Create and save Electron masterpieces.

## On the April 1984 tape:

**SPACEHIKE** A hopping arcade classic. **FRIEZE** Electron wallpaper. **PELICAN** Cross roads safely. **CHESSTIMER** Clock your moves. **ASTEROID** Space is a minefield. **LIMERICK** Automatic rhymes. **ROMAN** Numbers in the ancient way. **BUNNYBLITZ** The Easter program. **DOGDUCK** The classic logic game.

## On the March 1984 tape:

**CHICKEN** Test your nerve. **COFFEE** A tantalising word game. **PARKY'S PERIL** Parky's invisible maze. **REACTION TIMER** How fast are you? **BRAINTEASER** A puzzling program. **COUNTER** Mental arithmetic. **PAPER, SCISSORS, STONE** Out-guess your Electron. **CHARACTER GENERATOR** Create shapes.

## On the February 1984 tape:

**NUMBER BALANCE** Mental arithmetic. **CALCULATOR** Make your Electron a calculator. **DOILIES** Patterns galore. **TOWERS OF HANOI** The age old puzzle. **LUNAR LANDER** Test your skill. **POSITRON INVADERS** The old arcade favourite.

## On the introductory tape:

**ANAGRAM** Sort out the jumbled letters. **DOODLE** Multicoloured graphics. **EUROMAP** Test your geography. **KALEIDOSCOPE** Electron graphics run riot. **CAPITALS** New upper case letters. **ROCKET, WHEEL, CANDLE** Three fireworks programs. **BOMBER** Drop the bombs before you crash. **DUCK** Simple animation. **METEORS** Collisions in space.



See order form on Page 53



Learning can  
be fun

**FUN  
SCHOOL!**

Help with  
reading:

From simple shapes  
and letters to  
spelling and  
anagrams

3 cassettes  
for 3 age groups

- Under-5's
- Ages 5-8
- Ages 8-12

Help with  
maths:

From number  
recognition and  
counting to simple  
sums and games  
of logic

Early  
learning -  
the easy way  
on the BBC  
Micro and  
Electron

**10**  
programs  
on each  
cassette  
or disc

All  
programs  
classroom  
tested and  
educationally  
approved

Only  
**£4.95**  
cassette

Use the special order form  
on Page 53. No stamp needed.

## Scoop purchase for subscribers!

This detailed guide to the Electron's operating system is a must for every serious Electron user. In its information packed pages you'll find:

- ★ Full details of how to implement the powerful \*FX/OSBYTE calls.
- ★ Page ROMs revealed: The way they work and how to write your own.
- ★ Programming the ULA - all you need to know.
- ★ Full coverage of memory allocation and usage - make every byte count.
- ★ Complete circuit diagram: How to use the Electron's exciting expansion capabilities to the full.

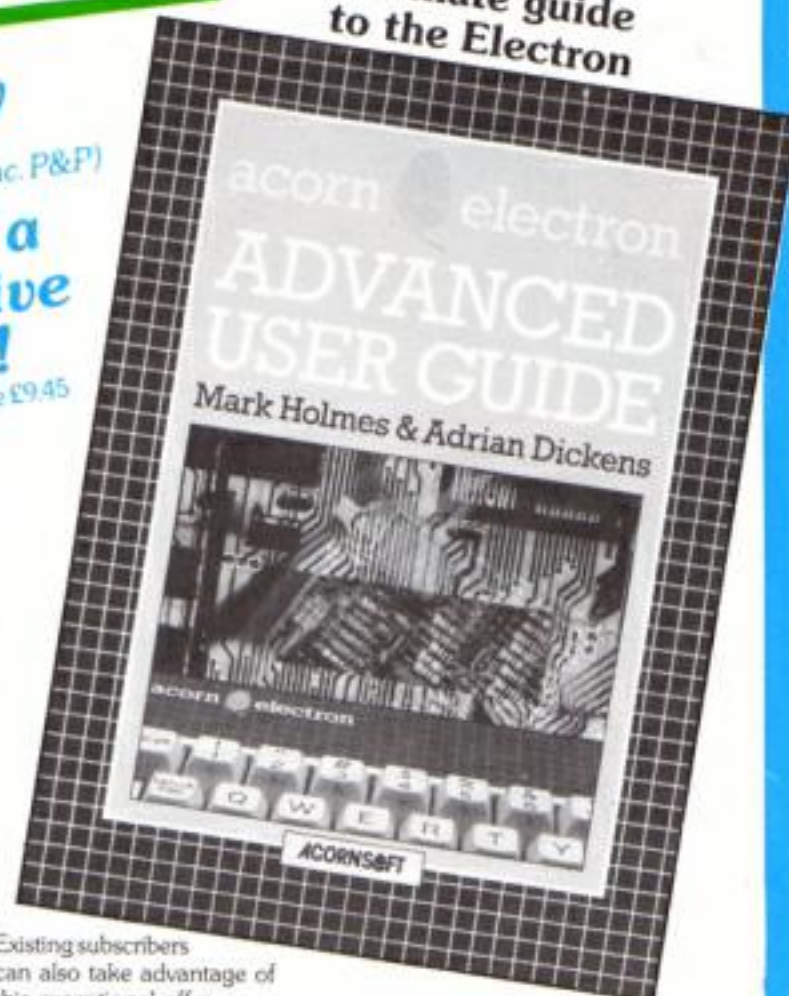
and much, much more...

Quite simply, the *Electron Advanced User Guide* is the essential guide to exploiting the full potential of the Electron.

Make sure of your copy by subscribing to *Electron User* and taking advantage of this money-saving offer!

Only  
**£3.45** (inc. P&P)  
Save a  
massive  
**£6!**  
Normal price £9.45

★ This is THE  
ultimate guide  
to the Electron



Existing subscribers  
can also take advantage of  
this exceptional offer.



# SAVE up to 50% on insuring your Electron (as well as your monitor, Plus 1, printer...)

Electron User has negotiated special terms with one of Britain's biggest insurance companies to cover your Electron system (including all peripherals) against theft, breakdown or accidental damage.

No insurance  
package has  
ever before  
offered you  
breakdown  
cover.

Your system is covered while it is in your own home, while it is temporarily elsewhere, and even when it is in transit – but only within the UK.

## Examples of this special price:

System worth	Premium
£200	From £10
£500	From £16
£1,000	From £35

Different rates apply to rural, urban and metropolitan areas.

A scheme is also available for businessmen which provides additional cover. Details on application.

Cornhill Insurance plc. have underwritten this offer.

Exclusive offers for subscribers to Electron User

Was £5.95  
**NOW £2.95**

## SAVE 50% on this classic book about BBC Basic

Based on the highly praised series for beginners in *The Micro User*, 'Getting started in BBC Basic' takes the reader through the fundamentals of writing programs.

Its hands-on approach has been specifically designed to teach the absolute novice not only the formal rules of Basic but also that elusive quality – good programming style.

By working through its many examples, the reader will gain a clear insight into structured programming and will quickly acquire the ability to use structured techniques in creating his own programs.



## Your Electron needs protecting!

Protect your Electron with our luxury dust cover made of soft pliable water-resistant vinyl, bound with strong cotton and decorated with the Electron User logo.

## Keep your copies neat and clean!

This handsome binder is bound in attractive red pvc with the Electron User logo in gold blocking on the spine. It will hold 12 magazines firmly secured in place by metal rods.





All prices include postage, packing and VAT

Overseas orders sent exclusively by Air Mail

£ p

Valid to July 31, 1986

Please enter number required in box

£ p

## Electron User tapes

£3.75  
UK

£4.75  
Europe/  
Overseas

26 introductory programs	3032	
Lunar Lander	1984 3033	
Chicken	1984 3034	
Spacehike	April 1984 3035	
Rally Driver	May 1984 3036	
Money Maze	June 1984 3037	
Golf	July 1984 3038	
Castles of Sand	Aug 1984 3039	
Haunted House	Sept 1984 3040	
Breakfree	Oct 1984 3041	
Star Fighter	Nov 1984 3042	
Christmas Box	Dec 1984 3043	
Space Battle	Jan 1985 3044	
The Kingdom of Craal	Feb 1985 3045	
Mr Freeze	Mar 1985 3046	
Super Archer	April 1985 3047	
Skramble	May 1985 3048	
Quasimodo	June 1985 3049	
Manic Mole	July 1985 3050	
Digga	Aug 1985 3051	
Tex'n' Dan	Sept 1985 3052	
Dungeon Quest	Oct 1985 3053	
Karate Warrior	Nov 1985 3054	
Get Set Santa	Dec 1985 3055	
Fruit Worm	Jan 1986 3056	
Grebit	Feb 1986 3057	
Grand Prix	Mar 1986 3300	
Invasion Force	April 1986 3301	
Missile Jammer	May 1986 3302	
Fishing	June 1986 3303	
Royal Wedding	July 1986 3304	

## Electron User back issues

£1.50 UK  
£2.50 Europe  
£3.50 Overseas

January 1985	3018	
February 1985	3019	
March 1985	3020	
April 1985	3021	
May 1985	3022	
June 1985	3023	
July 1985	3024	
August 1985	3025	
September 1985	3026	
October 1985	3027	
November 1985	3028	
December 1985	3029	
January 1986	3030	
February 1986	3031	
March 1986	3200	
April 1986	3201	
May 1986	3202	
June 1986	3203	

## Electron Plus 1

Plus 1 + game ROM cartridge

£39.95 UK 3084

## Electron Wordprocessor

Package

Plus 1 + View ROM cartridge

£59.95 UK 3099

## Electron Workstation

Package

Plus 1 + View and Viewsheet ROM cartridges

£69.95 UK 3085

## Electron Data Manager

Package

Plus 3 + Data Manager

£149.95 UK 3086

UK only Full details of offers on centre pages.

## Electron User annual subscription

UK & Eire (Sterling only) £12 3001  
Europe £20 3003  
Overseas £35 3004

Commence with \_\_\_\_\_ issue

Tick if renewal ☐

Electron Advanced User Guide £3.45\* 3072  
Insurance offer - I want to know more 2477  
Getting Started in BBC Basic £2.95\* 2289

\* Offers available to all subscribers

## Cassette tape annual subscription

£35 UK 3005  
£45 Europe/Overseas

Commence with \_\_\_\_\_

## Education Special Vol. 2 Classroom Computing on the Electron

Electron Cassette £4.95 3076  
Micro User Education Special No. 2 £1.50 2320  
Both the above £6.00 3077  
Europe/Overseas - add £1

## Fun School tape

(See p.51)

Under-5s 3080  
Ages 5-8 3081  
Ages 8-12 3082  
£4.95 UK  
£5.95 Europe/Overseas

## Mini Office

(See p.36)

£5.95 UK 3062  
£6.95 Overseas

## Ten of the Best

(See p.4)

Volume 1 3068  
Volume 2 3069  
£5.95 UK  
£6.95 Europe/Overseas

## Classic Card and Board Games

\*Add £1 for Europe  
\*Add £2 for Overseas (See p.16)

No. 1 Tape £5.95 3090  
3 1/2" Disc £7.95 3092  
No. 2 Tape £5.95 3091  
3 1/2" Disc £7.95 3093

## Magic Sword cassette

£5.95 UK 3064  
£6.95 Overseas (See p.61)

## Dust cover

(See p.52)

£3.95 UK 3058  
£4.95 Europe/Overseas

## Binder

(See p.52)

£3.95 UK 3059  
£6.95 Europe  
£10.95 Overseas



TOTAL

Send to: Electron User  
FREEPOST,  
Europa House,  
68 Chester Road,  
Hazel Grove,  
Stockport SK7 5NY.

Please allow 28  
days for delivery

Order at any time of the day or night

Telephone Orders  
061-429 7931

Orders by Prestel:  
Key \*89, then 614568383

MicroLink/Telecom Gold  
72:MAG001

Don't forget to give your name, address and credit card number

ENQUIRIES ONLY: 061-480 0171 9am-5pm

Payment: please indicate method (✓)

☐ Access/Mastercharge/Eurocard/Barclaycard/Visa

Card No. \_\_\_\_\_

☐ Cheque/PO made payable to Database Publications Ltd.

Name \_\_\_\_\_

Address \_\_\_\_\_

Post Code \_\_\_\_\_

Tel. \_\_\_\_\_

Expiry date  
/

EU7



# Software Supersavers

## ELECTRON

1.99  
LOTH STOLEN LAMP  
LOTH BATTLEZONE 2000  
LOTH ROMAN EMPIRE  
2.50  
COLLIN WHAT'S THE TIME?  
COLLIN KNOW YOUR TABLES  
COLLIN FIRST NUMBERS  
COLLIN STARTER PACK 1  
COLLIN STARTER PACK 2  
COLLIN PADDINGTON'S DISAPP. INK  
COLLIN PADDINGTON'S SHOPPING MIX  
COLLIN EARLY VISIT

2.50  
ACORN SHAPPER  
ACORN BOXER  
ACORN LISF  
ACORN SUPER PASCAL  
ACORN FORTH  
ACORN PAUL DANIEL'S MAGIC SHOW  
ACORN TREE OF KNOWLEDGE  
ACORN WORKSHOP  
ACORN MONSTERS  
ACORN FIRE BUG  
ACORN FREE FALL  
ACORN PHILOSOPHER'S QUEST  
ACORN STARSHIP COMMAND  
ACORN MAZE  
ACORN CASTLE OF RIDDLES  
ACORN CREATIVE GRAPHICS  
ACORN GRAPHS AND CHARTS  
ACORN DESK DIARY  
ACORN BUSINESS GAMES  
ACORN PERSONAL MONEY MANAGEMENT  
ADVENT ESCAPE FROM PULSAR 7  
ADVENT TIME MACHINE  
ADVENT ARROW OF DEATH  
ADVENT MAX WORKS  
ADVENT GOLDEN BATON  
ADVENT PERSEUS AND ANDROMEDA  
ADVENT CIRCUS  
ENGISOP JET BOOT JACK

2.95  
MPOWER ADVENTURE  
MPOWER BUMBLEBEE  
MPOWER CYBORG MISSION  
MPOWER ELECTRON INVADERS  
MPOWER FELIX AND FRUIT MONSTERS  
MPOWER THE MINE  
MPOWER DANGER UKB  
MPOWER ESCAPE MOONBASE ALPHA  
MPOWER HUBBLE TROUBLE  
MPOWER FRENY  
MPOWER POSITRON  
MPOWER GALACTIC COMMANDER  
MICRO MOONRAIDER  
TINSPT FIVE-A-SIDE SOCCER  
TINSPT GUNSMOKE  
TINSPT SUPER POOL  
TINSPT STRATO BOMBER  
TINSPT HYPER DRIVE  
TINSPT CATAPILLA  
TINSPT INVADERS  
TINSPT VORTEX  
TINSPT 3D BOMB ALLEY  
TINSPT BLITZKRIEG  
TINSPT AUF WIEDERSEHEN PETI  
LONGMAN FIRST MOVES (CHECKS)  
INCEPT TALES OF ARABIAN NIGHTS  
A\*N\*P PHAROAH'S TOMB  
A\*N\*P KAMIKAZE

3.95  
A\*N\*P CHUCKIE EGG  
A\*N\*P CYCLONE ATTACK  
ADVENT GREMLINS  
CENTUM PCW GAMES COLLECTION  
CENTUM BEST OF PCW (25 PROGRAMS)  
4.95  
ATARI ROBOTRON

**BOOKS** 2.50  
DYNAMIC GAMES FOR YOUR ELECTRON  
WORKING ELECTRON  
TEXT BASIC BASIC ELECTRON  
PCW GAMES COLLECTION ELECTRON  
DISCOVER YOUR ELECTRON  
VIRGIN GAMES FOR THE ELECTRON

SEND FOR OUR  
**FREE**  
CATALOGUE

2.50  
+20p P+P



2.95  
O LEVEL PHYSICS  
O LEVEL CHEMISTRY  
O LEVEL MATHS  
O LEVEL BIOLOGY

BBC/ELECTRON GIFT PACK:-  
PARAS, BATTLEZONE 2000,  
JOHNNY REB, STOLEN LAMP,  
EMPIRE & ROMAN EMPIRE.



# LOGIC SALES LTD.

Title	Price	Title	Price
Football Manager*	6.95	Twin Kingdom Valley**	3.50
Micro Olympics**	3.95	Mini Office II* (cas)	12.95
DBL Phantom Combat*	17.95	Mini Office II* (disc)	14.95
Combat Lynx**	6.95	Commando**	7.95
Contraption*	6.95	Hypersports* (disc)	12.95
Yie Arh Kung Fu** (cas)	6.95	Moon Cresta*	6.95
Yie Arh Kung Fu* (disc)	12.95	Scrabble*	10.95
Island Logic Music System		Bugeyes II**	7.95
Cass.*	12.95	Red Moon*	4.95
Cass.* 2	12.95	Return to Eden*	4.95
Disc*	26.95	Blockbusters**	5.95
Lord of the Rings* (cas)	12.95	Strike Force Harrier** (cas)	7.95
Lord of the Rings* (disc)	14.95	Strike Force Harrier* (disc)	9.95
Matchday*	7.95	Repton**	7.95
Citadel**	7.95	Deathstar**	7.95
Speech* (Disc)	10.95	Speech* (cas)	7.95

## SUPER SAVERS ALL UNDER £4

Chess**	2.50	Cosmic Cruiser*	2.50
Frenzy**	2.50	Jet Pac*	2.50
Rubble Trouble**	2.50	Ten Little Indians*	2.50
Moonraider*	2.50	Castle Blackstar*	2.50
Felix and the Fruit Monsters**	2.50	Stolen Lamp**	2.50
Felix and the Evil Weevils*	2.50	Gremlins**	3.95
Daredevil Dennis*	2.50	Battlezone 2000**	2.50
Demolator*	2.50	Bismark*	2.50
Pengi*	2.50	Roman Empire**	2.50
Swoop*	2.50	Empire**	2.50

\* = BBC. \*\* = Electron

Large range of educational software. Please send self addressed envelope for list. Prices from £2.50

## Acornsoft titles for Electron £2.50 each:

Snapper, Boxer, Turtle Graphics, Planatoid, Tree of Knowledge, Business Games, Desk Diary, Lisp, Forth, Castle of Riddles, Freefall, Talkback, Workshop, Hopper, Chess.

ALL PRICES INCLUDE VAT, PLEASE ADD 80p POSTAGE

## LOGIC SALES LTD.

19 The Broadway, The Bourne,  
Southgate, London N14 6PH.

24hr. Order Line 01-882 4942 ACCESS & VISA CARDS WELCOME.

## IT'S ADVENTURE TIME At SHARDS SOFTWARE

We specialise in original, playable adventures, our range spanning all ages and abilities. All of our games have received favourable reviews by the press and public alike, and are available now at special low prices.

**WOODBURY END:** was £9.95 now £6.95 (NEW LOW PRICE)

An illustrated adventure set in a mysterious English village. Explore this fascinating place, talk to strange people and discover unusual artefacts, but, remember, you only have 20 days to discover the awesome secret of Woodbury End before...  
"The best adventure we have played, completely gripping and absorbing". B. Titterton, Derby.

**PETTIGREW'S DIARY:** was £7.95 now £3.95

A three part family adventure taking you from a farmhouse in Oxfordshire, through the bustling London streets, to a trek across Europe, in search of the secret of the enigmatic diary (graphics and text)

"Most original and entertaining adventure". Computer and Video Games.

**MYSTERY OF THE JAVA STAR:** was £7.95 now £3.95

A four part educational adventure with three levels of play and suitable for young and old alike. A treasure hunt across the world, packed with puzzles and challenges. (Graphics and text)

"An excellent educational program with something of interest to kids of all ages". Electron User.

**GALILEE** was £8.95 now £4.95

A historical adventure set in Biblical times in the Holy Land. Visit authentic places and meet real characters drawn out of the pages of the bible. A text adventure with levels for novice as well as the experienced adventurer.

"It is entertaining and will appeal to many". Personal Computer News.

All programs are suitable for BBC and Electron. Send for our new catalogue for full details of our adventure and educational software.

Either phone your ACCESS/VISA order to:

01-514 4871 or send the coupon below to SHARDS SOFTWARE, FREEPOST  
(No stamp required), ILFORD, ESSEX IG1 2BR.

Please send me .....

Name .....

Address .....

I enclose a Cheque/PD/VISA/ACCESS for .....

Credit Card Number .....

Please send me a copy of your catalogue .....

## \*\* PMS ANNOUNCE \*\*

## THE ELECTRON 6502 2nd PROCESSOR IS HERE !!!

At the incredible price of ONLY

**£89.00 (inc VAT)**

30K BASIC programs in MODE 0 at BBC speed  
30K free in the VIEW family - all MODES  
45K free in 'HI' languages - all MODES.

## FULL DETAILS NEXT MONTH

or if you can't wait, contact:

Permanent Memory Systems  
38 Mt. Cameron Drive,  
EAST KILBRIDE G74 2ES  
PHONE (03552) 32796 (24hr)



# Formatter

**THIS is a machine code utility designed to make long listings of programs easier to read. When run it adds the new star command FORMAT to the operating system.**

Long and complex lines where there are several statements separated by colons are often difficult to follow in a listing — especially on a screen in 40 column mode. So after entering:

**\*FORMAT**

these multi-statement lines will be split up and listed with each of the statements on a separate line. When you've finished enter:

**\*FORMAT**

again and formatting will be switched off. If you forget to switch it off before running a program you may find the program acting peculiarly as

Formatter will format the text.

It works by intercepting the oswrch vector, since all text printed on the screen or printer passes through this.

Each character is checked to see if it is a colon and when one is found a carriage return, line feed and five spaces are printed before sending the colon.

The oscli vector is also intercepted by the routine. All star commands pass through this.

Any star command entered is checked to see if it is FORMAT. If it is it jumps to our routine, if not it jumps to the operating system as normal.

The Break vector is intercepted so that the routine will still function after Break or Control+Break.

Leave out lines 580, 590 and 600 until you have the program working correctly as these alter the vector.

## How to make long programs easier to read

By **KEITH  
TRANGMAR**

```
10 REM Listing Formatter
20 REM By Keith Trangmar
30 REM (c) Electron User
40 FOR PASS=0 TO 2 STEP 2
50 PX=&900
60 command=&70
70 wrchv=&72
80 cliv=&74
90 flag=&76
100 colon=&77
110 [OPT PASS
120 \
130 \ Change vectors to point to user routine
140 .break
150 BCS set_up:RTS
160 .set_up
170 CLI
180 LDA#0:STA flag
190 LDA &200:STA cliv
200 LDA &209:STA cliv+1
210 LDA &20E:STA wrchv
220 LDA &20F:STA wrchv+1
230 LDA#clint MOD256:STA
```

```
&200
240 LDA#clint DIV256:STA
&209
250 LDA#start MOD256:STA
&20E
260 LDA#start DIV256:STA
&20F
270 SEI
280 RTS
290 \
300 \ Identify *FORMAT command
310 .clint PHP:PHA:STX command:STY command+1:LDY#1
320 .check_loop LDA (command),Y:CMP format,Y:BNE not_format:INY:CPY#6:BNE check_loop
330 \
340 \ Print 'Ok.'
350 LDA#79:JSR oswrch:LDA#107:JSR oswrch:LDA#46:JSR oswrch:JSR &FFE7
360 INC colon:LDA command
```

```
:CLC:ADC#6:BCC skip2:INC command+1
370 .skip2 TAX:LDY command+1:PLA:PLP:RTS
380 .not_format PLA:PLP:LDX command:LDY command+1:JMP (cliv)
390 \
400 \ Check for colon being printed
410 .start CMP#58:BEQ check:CMP#34:BNE oswrch:INC flag
420 .oswrch JMP(wrchv)
430 .check LDA colon:AND#1:BNE test
440 .print_colon LDA#58:JMP oswrch
450 .test LDA flag:AND#1:BNE print_colon
460 \
470 \ New line and tab
480 JSR&FFE7:LDX#5:LDA#9:loop JSR oswrch:DEX:BNE loop
```

```
op
490 JMP print_colon
500 .format EQU$*FORMAT*
510 J:NEXT
520 CALL set_up
530 ?colon=0
540 REM *THIS:BIT:IS:IN:5 PEECH:MARKS.*
550 REM::BUT:THIS:BIT:IS:NOT !:
560 *KEY1 L.INIM
570 *FX138,0,129
580 *FX247,76
590 *FX248,0
600 *FX249,9
610 *FORMAT
```

*This listing is included in this month's cassette tape offer. See order form on Page 53.*



**EXCITING** news this month is that Robico has released *Project Thesius*, the follow up to *Rick Hanson*. It is subtitled *Rick Hanson II* and seems every bit as good as the last one.

Another new release is Gilsoft's *Quill*, which I hope to review next month. Shards also told me that it will have released a new game by the time you read this.

Called *Operation Safras* it will be presented in the same manner as *Woodbury End* and I look forward to seeing it.

I'm afraid I also have some bad news. I can no longer answer letters personally on problems in adventures.

My mailbag has been increasing steadily since I started this column and I now get over 100 letters a week, which leaves me little time to research and write the column.

I would ask those of you who are waiting for an answer to be patient while I clear the backlog.

Of course I still want you to write in with your problems and I will answer them through these pages.

I get great enjoyment from reading your opinions so please feel free to write in – if only for a chat.

I would like to point out though that about 90 per cent of the questions I am asked

have already been answered in the column at some time, so it is always worth checking your back issues.

For anyone in desperate need of help I am starting a new section called the *Lords of Adventure*.

If you can help readers with any adventures let me know and I'll publish your name, address and the games you can help with. I'll make you one of my *Lords of Adventure*.

*Citadel* seems to be prompting a lot of mail and I am sure that anyone offering

help would be much appreciated.

This month also sees the first *Top Twenty*. It has been compiled from all the marks sent to me over the last year.

Apart from the position that each game earned I have also given the average mark that each received. As you can see from the chart it has been very close.

*Epic* unsurprisingly won top spot and managed to get all of its range into the *Top Ten*. I wonder how they will fare against the new competition from Robico in the coming year?

Melbourne House has also done well in getting its three games into the *Top Ten*.

*Woodbury End* is a recent release from Shards and has done superbly to get into the charts in so short a time.

Keep your marks coming in for the next *Top Ten*.

Ian Ruthven who has sent in tips for *Twin Kingdom Valley* which I will be revealing in the future has also asked for help with *Citadel*. Any *Lords of Adventure* care to oblige?

Guy Richardson asked for *Merlin's* help but didn't specify what with. What do you want help with Guy? Unfortunately my magic powers don't stretch to mind reading.

Neil Sedgwick came up with two worthwhile suggestions for software houses. Firstly, enclose a second cass-

ette with the adventure to be used as a save-game tape.

This would avoid the need to search through various cassettes for the right tape – especially useful if you haven't played the game for a while.

Secondly, why not have a compilation tape of adventures? Quite often when compilation tapes are released there are a couple of games and one adventure so why not have all adventures?

I agree with both of these suggestions Neil – software houses please note.

Richard Jay is compiling a database of adventure clues and asks me to print his name and address so that readers can send him maps and solutions for it.

You can write to him at 102 Highcliffe Road, Wickford, Essex, SS11 8JX.

I'm not quite sure how you stand with copyright laws if you market this Richard, but I would think it only fair to give copies of your database to any reader who writes in.

W.E. Trevelyan asked if I would indicate the age level that a program is aimed at when I review it.

He goes on to suggest that *Adventureland* is aimed at players up to the age of 12, the *Epic* games at astute 14 to 15 year olds and *Hampstead* at the 18+ age range.

Frankly I don't think you can categorise adventures this way. *Adventureland*, the first

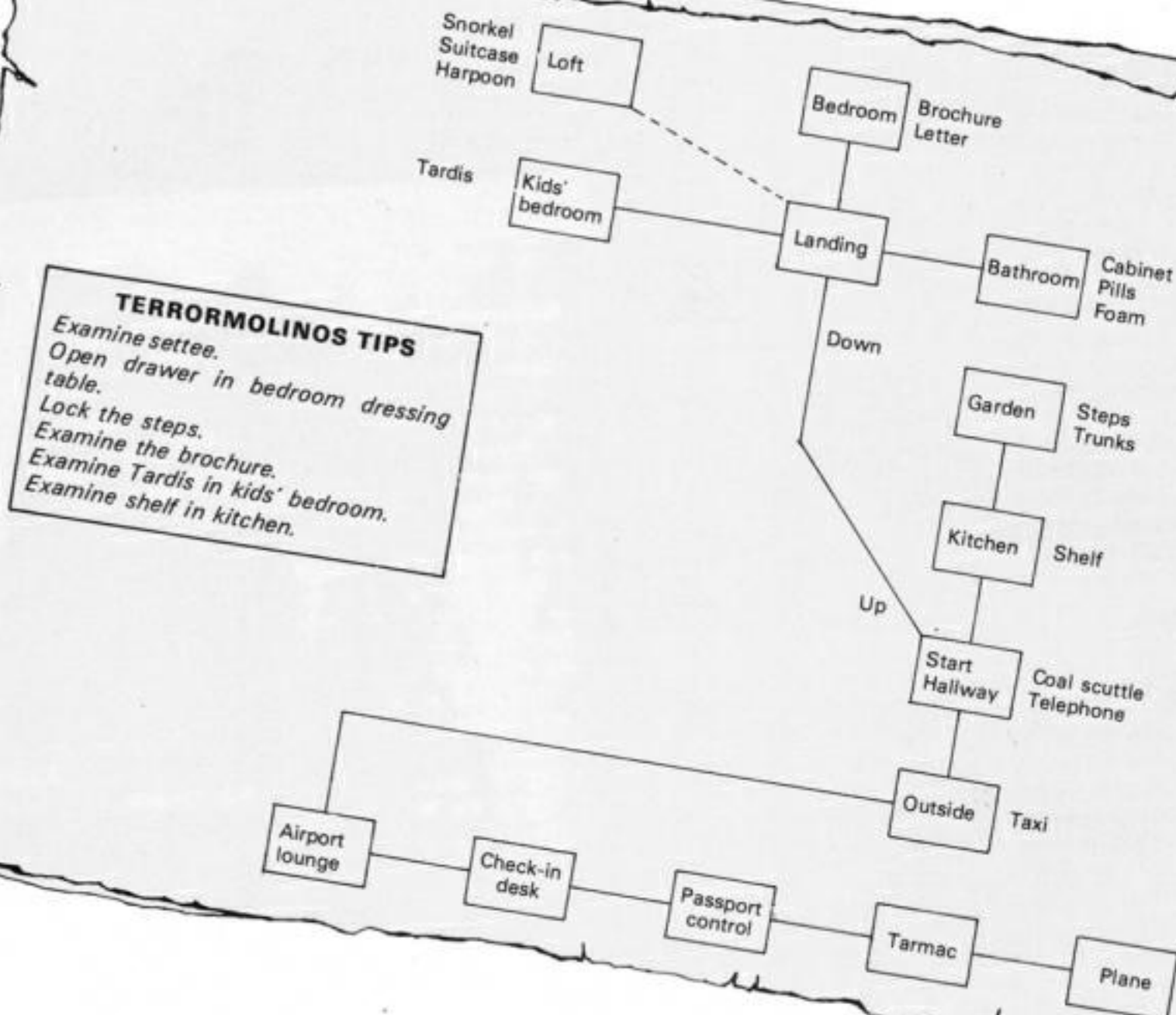


## Rick Hanson's back, as lively as ever

### Adventures Top 20

1	Wheel of Fortune	Epic	91
2	Castle Frankenstein	Epic	86
3	Classic Adventure	Melbourne House	84
4	Kingdom of Klein	Epic	83
6	Countdown to Doom	Acornsoft	82
	Hampstead	Melbourne House	
	Terrormolinos	Melbourne House	
8	Woodbury End	Shards	81
9	Twin Kingdom Valley	Bug-Byte	80
10	Quest for Holy Grail	Epic	79
	Eye of Zoltan	Softek	
12	Spiderman	Adventure Int.	78
13	Sphinx Adventure	Acornsoft	77
14	Greedy Dwarf	Dorling Kindersley	76
	Strange Odyssey	Adventure Int.	
	Staff of Law	Potter	
17	Pirate Adventure	Adventure Int.	75
18	Adventureland	Adventure Int.	74
	Five Stones of Anadon	Softek	
20	Galadriel in Distress	Potter	73
	Incredible Hulk	Adventure Int.	





home computer adventure, first saw light of day on a TRS-80.

In those days a 12-year-old would be unlikely to have access to the computer, let alone the game itself.

I respect all my reader's opinions, but in this case I would like to point out that I have received letters from people aged between 5 and 75 about the games you mention.

I feel that the only way to categorise an adventure is by how difficult it is compared to its cost. Even then it is only

one opinion and will obviously differ from person to person.

Incidentally my "inexplicably cool opinion" about Hampstead was due to it relying too heavily on humour for atmosphere, and since the humour didn't appeal to me I didn't feel there was any atmosphere.

I appreciate that it is a complex adventure and its popularity in the Top Twenty proves that most readers like it, but I didn't. Terrormolinos on the other hand appeals immensely to me.

**Merlin**

## Hall of Fame

### Woodbury End

*Les Shipton*

The Help clues continued –

- Office hours suffice. Get the keys from the Mayor's office between the hours of 8 and 5.
- Open Sesake. Go into the records office and start reading the report.
- Pick a so near give cheer. Examine the print for the combination to the shed. Don't take the print with you though.
- Digital do-it-all. Getting the cube from the shed.
- Well can you handle that. Turn the well handle and look.

### Wheel of Fortune

*Craig Romans*

You will now be underground so use the lamp, but since you are in real time be careful not to waste it.

Collect as much treasure as you can, but make sure you work your way south and go into the fly's cave and back out

into the spider's cave – don't waste time though.

Now get the wheel and go back to the fly's cave for the penny. Decide for yourself what you want to leave underground, but make sure you keep the basket.

Go to the steps and up to the trapdoor. Unbolt it and go up into the building.

Now go to the machine and insert the penny. Go back to the building and leave all your treasure except the music box. Now spin the wheel.

### Spiderman 2

*Robert Henderson*

Go to floor 1 and give the calcium to the lizard. Go into the hall and shoot a web at the bio gem. You can now take it.

Go to the sandman's room, then up on to the ceiling and

## Contact Corner

If you want an adventure pen-pal why not write to one of the readers mentioned here.

Anyone who wants their name included should write in, making sure that their name and address is legible.

- Jason Harken, 156 Black-a-tree Road, Nun-eaton, Works. CV10 8AG.
- Mike Lacey, 397 Baker Street, Alvaston, Derby DE2 8SJ.
- Alan Jones, 5 Hayes Close, Newtown, Bristol BS2 0AG.



## From Page 57

LOOK CRIB. Get the formula then look again and get the gem.

Drop the formula, GO FLOOR and leave the room. Go to floor 2 then outside until you are floating.

FEEL NORTH, get the gem, go south and FEEL SOUTH and get the other gem. Then JUMP UP, take the mesh and enter the fan.

Keep shooting web at it until its speed falls to 50 RPM. Now shoot a web at the button and CRAWL FAN. Keep going down until you see Dr. Octopus.

### Gisburne's Castle Paul James

Use the oil on the rusty door to free it, then open it with the key. Use the potion to reduce your size. The spade is used in the dungeons to get to the cellar, and the cannon ball and gunpowder are used to load

the cannon. If you have found the cannon you have also found Gisburne. Finally use the flint to fire the cannon and kill him.

### The Count A.J. Haynes

Day 1. Get up and wait for the bell to ring. Go to the front door and take the postcard.

Now go to the kitchen and lower the dumb waiter when you have entered it. GO ROOM, take the clip from the postcard and pick the lock.

Keep the clip but store all the other objects in the room with the century worth of dust. Lock the door and go to bed and sleep.

### Revenge of Zor H.J. Bastien

Search for the courtyard for a rope and frisk the guard for a whistle. Throw and pull the rope to free the grating.

Throw the rope again and climb it. Now blow the whistle in the forest to get a fly swatter

and push the altar and read the book. The book gives the ingredients to use in the mixing bowl. Kill the flies with

the swatter, then drop them to make the frog appear. Finally throw the net to catch the frog and bat.

## Feedback

Dave Frankham has sent in a map and solution to **Gisbourne's Castle**. If anyone wants a copy please send an sae.

Incidentally, Dave, I'd recommend either the Epic or Robico range for your next adventure.

J. Foggitt offers help on Nicholas Latham's problem with **Bored of the Rings**.

After leaving the downs go along the East/West road until you are next to the mountain.

There is an exit North here which leads to the mountain where you'll find a bag of pepper.

Go to the Morona gate, collecting your friends from

Riverdull along the way, and then drop the bag. One of your friends will sneeze and provide a means of getting through the gate.

W.E. Trevelyan reveals that Lou Carey is wrong to say that in **Galadriel in Distress** both the bottle and the goblet contain poison.

It is in either one or the other depending on a ransom spin of a coin. The Loremaster will tell you which is safe and which is not.

M. Alexander has sent in a solution to **Sphinx Adventure**. An sae please if you want me to send you a copy.

## BARGAINS — £2.95 each

### ACORNSOFT

Firebug  
Monsters

### A&F SOFTWARE

Kamakazi  
Pharaoh's Tomb

### ENGLISH SOFTWARE

Jet Boot Jack

### BUG-BYTE

Twin Kingdom Valley  
Tennis

### LOTHLORIEN

Stolen Lamp

### MYSTERIOUS ADVENTURES

Arrow of Death  
Circus  
Escape from Pulsar 7  
The Golden Baton  
Perseus and Andromeda  
The Time Machine  
Waxworks

### SOFTWARE INVASION

3D Bomb Alley  
Gunsmoke  
Blitzkrieg  
Vortex  
Super Pool

### MICROPOWER

Adventure  
Bumble Bee  
Chess  
Croaker  
Cybertron Mission  
Danger UX8  
Electron Invaders  
Escape Moonbase Alpha  
Felix in the Factory  
Felix and the Fruit Monsters  
Felix meets Evil Weevils  
Frenzy  
Galactic Commander  
Gauntlet  
Ghouls  
Jet Power Jack  
Killer Gorilla  
The Mine  
Moonraider  
Positron  
Rubble Trouble  
Stock Car  
Swag

### £2.95 each

Please give an alternative if possible

## MITHRAS SOFTWARE

We now offer a choice of ways to buy 40 top games for the Electron. You may pay the normal retail price and choose one of our £2.95 Bargain games FREE or you may pay the lower price for the top game only.

	Price with free game	Discount Price		Price with free game	Discount Price
<b>AARDVARK</b>			<b>MARTECH</b>		
Frak .....	7.90	6.50	Geoff Capes		
<b>ACORNSOFT</b>			Strongman .....	8.95	7.25
Elite .....	12.95	10.95	Brian Jacks Superstars .....	7.95	6.50
<b>ADDICTIVE</b>			Eddie Kidd Jump .....	7.95	6.50
Football Manager .....	8.95	7.25	<b>MELBOURNE HOUSE</b>		
Boffin .....	9.95	7.95	Way of Exploding Fist .....	9.95	7.95
<b>BRITANNIA</b>			<b>MIRRORSOFT</b>		
Play your cards right ...	7.95	6.50	Strike Force Harrier ....	9.95	7.95
<b>CDS</b>			<b>ROBICO SOFTWARE</b>		
Steve Davis Snooker ..	8.95	7.25	Rick Hanson .....	9.95	7.95
<b>DR. SOFT</b>			Project Thesius .....	9.95	7.95
Phantom Combat .....	9.95	7.95	<b>SOFTWARE INVASION</b>		
<b>DURELL</b>			Chip Buster .....	7.95	6.50
Combat Lynx .....	8.95	7.25	Stairway to Hell .....	12.95	10.95
<b>ELITE</b>			<b>SUPERIOR SOFTWARE</b>		
Commando .....	9.95	7.95	Overdrive .....	7.95	6.50
<b>GILSOFT</b>			Repton .....	9.95	7.95
The Quill .....	16.95	14.95	Repton 2 .....	9.95	7.95
(write your own adventures)			Tempest .....	9.95	7.95
<b>HEWSON</b>			Death Star .....	9.95	7.95
Southern Belle .....	7.95	6.50	Citadel .....	9.95	7.95
<b>ICON/AUDIOGENIC</b>			Karate Combat .....	8.95	7.25
Caveman Capers .....	7.95	6.50	<b>TYNESOFT</b>		
Bug Eyes 2 .....	7.95	6.50	Ian Botham's		
<b>IMAGINE</b>			Test Match .....	7.95	6.50
Yie Ar Kung Fu .....	8.95	7.25	Winter Olympics .....	7.95	6.50
<b>MACSEN</b>			Mousetrap .....	7.95	6.50
Blockbusters .....	7.95	6.50	Jet Set Willy .....	7.95	6.50
Blockbusters Gold Run ..	9.95	7.95	<b>US GOLD</b>		
Bulls Eye .....	8.95	7.25	Beach-Head .....	8.95	6.95
Treasure Hunt .....	9.95	7.95	Quest Probe .....	7.95	6.50

## SPECIAL OFFERS

These games may not be chosen as part of the free game offer:

### ACORNSOFT

Philosopher's Quest ..... 3.50  
Castle of Riddles ..... 3.50  
Planetoid ..... 3.50  
Maze ..... 3.50  
Paul Daniel's Magic Show ..... 3.50  
Lisp ..... 3.50  
Forth ..... 3.50  
S-Pascal ..... 3.50

### A&F SOFTWARE

Chuckie Egg ..... 3.95  
Cylon Attack ..... 3.95

### ADVENTURE INTERNATIONAL

Gremlins ..... 3.95

### ATARISOFT

Robotron ..... 4.95

### SHARDS

Pettigrews Diary ..... 3.95

### OCEAN

Hunchback ..... 5.50

### FIREBIRD

### SUPER SILVER

Star Drifter ..... 3.95

### ANCO

Thai Boxing ..... 5.50

ALL PRICES INCLUDE  
POSTAGE AND PACKING IN UK

(Overseas orders please add  
50p for each tape ordered)

Orders will normally be  
despatched by First Class Post  
within 7 days of receipt of order.

Send cheque or PO payable to:

**MITHRAS  
SOFTWARE (EU)**

P.O. Box 151, Maulden,  
Bedford MK45 2YH.



# Little 'uns learning to play, and playing to learn

**MANY** parents have bought an Electron for children with some hope that it might help in their education. For teenagers this could mean buying an exam revision package, but for youngsters aged less than 11 the computer may seem a white elephant.

Its main use appears to be for shooting aliens or outwitting gorillas, and most people do not think of such arcade games as educational.

The aim of this article is to help parents and children get a bit more education from the Electron, while still keeping that vital element of fun.

Let's start with the very young – the under-fives or non-readers. There are quite a number of programs aimed at this age range which can help

to teach a range of skills.

These may involve colour matching or recognising similar shapes. Children may be required to compare the attributes or features of pictures, or organise a sequence of events.

This may not sound like traditional learning, but for a child to be a successful scholar he or she must develop good visual discrimination and be able to plan a course of action.

In fact the skills of visual discrimination, matching and sequencing are vital for any child who is learning to read.

Programs for pre-readers can often be found in magazines. The Simon game, for instance, encourages memory and sequencing.

Pelmanism is a memory game, and on the computer it

stimulates cooperation with other people rather than competition.

Examples of these types of programs can be found in the Fun School series (Page 51).

Mirrorsoft produces excellent software for youngsters. The funny and stimulating Mr Men programs are highly recommended.

Arcade games have value too. One like Acornsoft's Snapper is fairly easy to play and encourages good hand and eye coordination and a bit of forward planning.

However don't expect under-fives to sit at the computer on their own. Contact with a sympathetic adult is essential.

A grown up can ensure that the computer is used sensibly. There seems little point, for instance, in getting children to count balloons on a screen when real objects can be handled.

Mathematics, though, is a symbolic representation of reality. The Electron can be a real help with learning the value of a number and the symbol used for it.

Choose one which gives a good graphic and sound reward for success. However make sure that the failure routine is not so interesting that kids will be encouraged to get things wrong.

There are a number of programs for children who have acquired the rudiments of reading. A favourite of many

five and six year olds is Podd published by ASK.

Podd is a large figure who can do 120 things. All youngsters have to do is type in a "do" word. If Podd can do it he graphically does it. If he can't he says he's sorry.

ASK has deliberately not supplied a list of the things that Podd can do, so children and the adults who help them must use their own ideas.

It's a very simple program that encourages little ones to think, spell accurately and use their imagination.

For early readers there are various levels of Read Right Away from Highlight Software. These provide practice at matching beginnings and endings of words and help children to learn about the sounds groups of letters make.

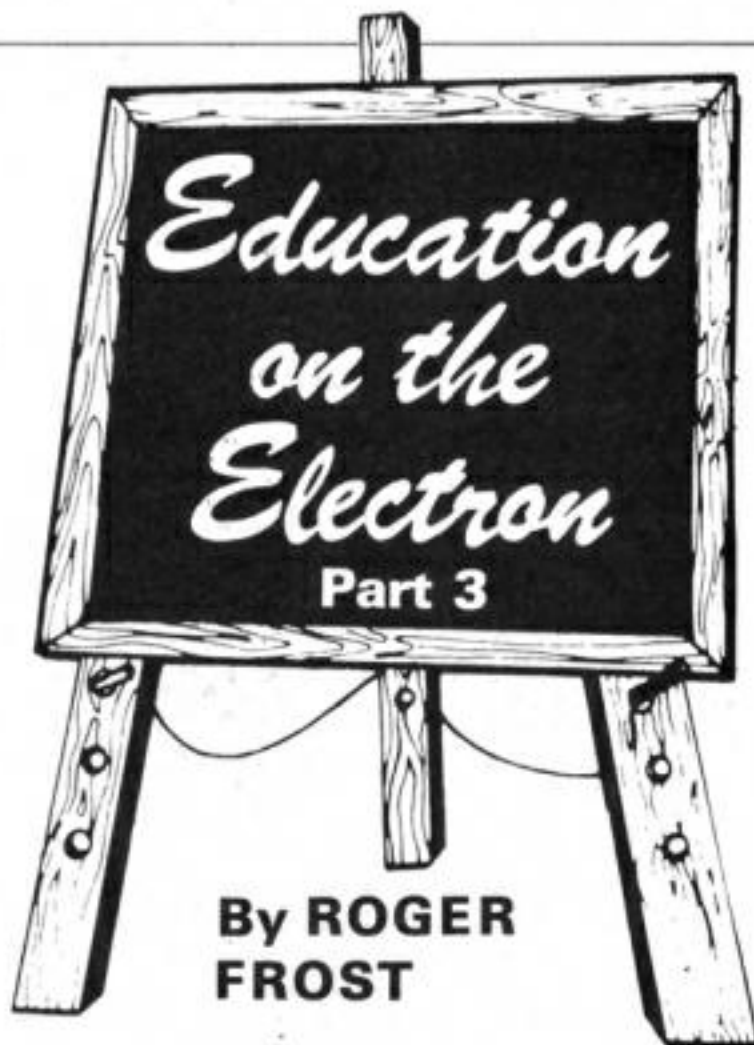
Like the Mirrorsoft Mr Men programs, they will cater not only for new readers, but for competent ones too.

When selecting software to assist with reading make sure it is suited to your child's ability. If the program is too difficult for a child boredom will quickly set in.

Another point to bear in mind is that many different reading schemes are used in schools. The wrong software could confuse a new reader.

Try to find out which system your child uses and if a particular program is suited.

For children who can read



Arcade games have value too... Acornsoft's Snapper is fairly easy to play and encourages good hand and eye coordination



## From Page 59

reasonably well text adventure games stand head and shoulders above all others as far as educational value is concerned.

A good adventure like a good book will encourage children to read, but as an extra, responses are required which need to be well thought out and correctly spelt.

While playing adventures a child is having to solve problems and if the program is well written the problems should be logical.

Adventures are usually so big that a child, or an adult, can't remember everything. This leads youngsters into realising that they will have to keep a record of where they have been and what they have found.

So adventures, which are usually thought of as games, will get youngsters reading, writing, recording in map or table form, problem solving and thinking logically.

If you can get more than one child to work on an adventure you get the added benefits of verbal reasoning and discussion.

That's not a bad cross section of the activities that go

on in a primary school.

Children aged from about five will be able to cope with the more simple adventures, but a friendly adult will probably need to be at hand to encourage them.

One of the best starter adventures is *The Magic Sword*, from Database Publications. This package starts with a picture story book which sets the scene.

The program, which extends the story, makes use of simple graphics and sound.

The text is straightforward and well thought out, and the responses required by players are kept to a minimum to avoid frustration.

A compass is permanently displayed and a game can be

# Children aged eight and upwards may cope with adult adventures

saved to cassette for completion later. If you've got children under nine and want to get just one good program this is the one I would recommend.

There are, of course, other good adventures written with children in mind. Comsoft produces the excellent *Serpents Lair* and Tynesoft has released *Super Gran* for the Electron.

Children aged eight and upwards may cope with adult adventures, and graphic adventures such as *Repton* and *Citadel* will provide many of the same skills as text versions.

A quick look at *Merlin's Cave* will give you lots of other titles to choose from.

If you don't like the fantasy nature of adventures then you could follow the lead of many schools by using simulation programs.

In these children take on the role of a different person and have to cope with the problems of a totally different lifestyle.

Among the best of these is *Osprey*, from Bourne Educational Software where you take the part of a warden protecting a site containing osprey nests.

You have to decide how to allocate resources to ensure success for the ospreys, but also enjoyment for tourists in the area.

A program like this has many of the same educational points as an adventure, but will also induce children to consider the consequences of their decisions.

Once again, simulations are ideal for a team effort, so that ideas can be pooled and decisions thrashed out.

Many other simulations are

used in schools. They may have a historical or geographical flavour. They can have a sporting basis, such as *Football Manager*, or they can even use foreign language skills.

The content of such programs may be important, but it is secondary to the skills gained by children.

The computer allows a child to think of a possible course of action and then test it. That's something that often can't be done in reality because of cost and danger.

For instance in *Francis Drake* by LCL the problems of being a Tudor mariner can be explored.

As well as programs that might help the general education of your children there is plenty of subject-specific software.

There must be enough number programs to keep a budding Einstein busy just counting them. Most involve addition, subtraction, multiplication and division.

Another frequently covered subject is telling the time. Here *Alligata's Primary Time* is worth looking at.

Kosmos produces a neat Geography program and Chalksoft's *Note Invaders* will help with musical notation.

Make sure any program you buy has a fun element to it. If the program is dull it won't be willingly used.

That's just about it for educating under elevens on the Electron. Don't forget the word processors and databases, and remember that computers are just as much for girls as for boys.

● Next time we'll consider the pros and cons of youngsters learning to write simple programs.

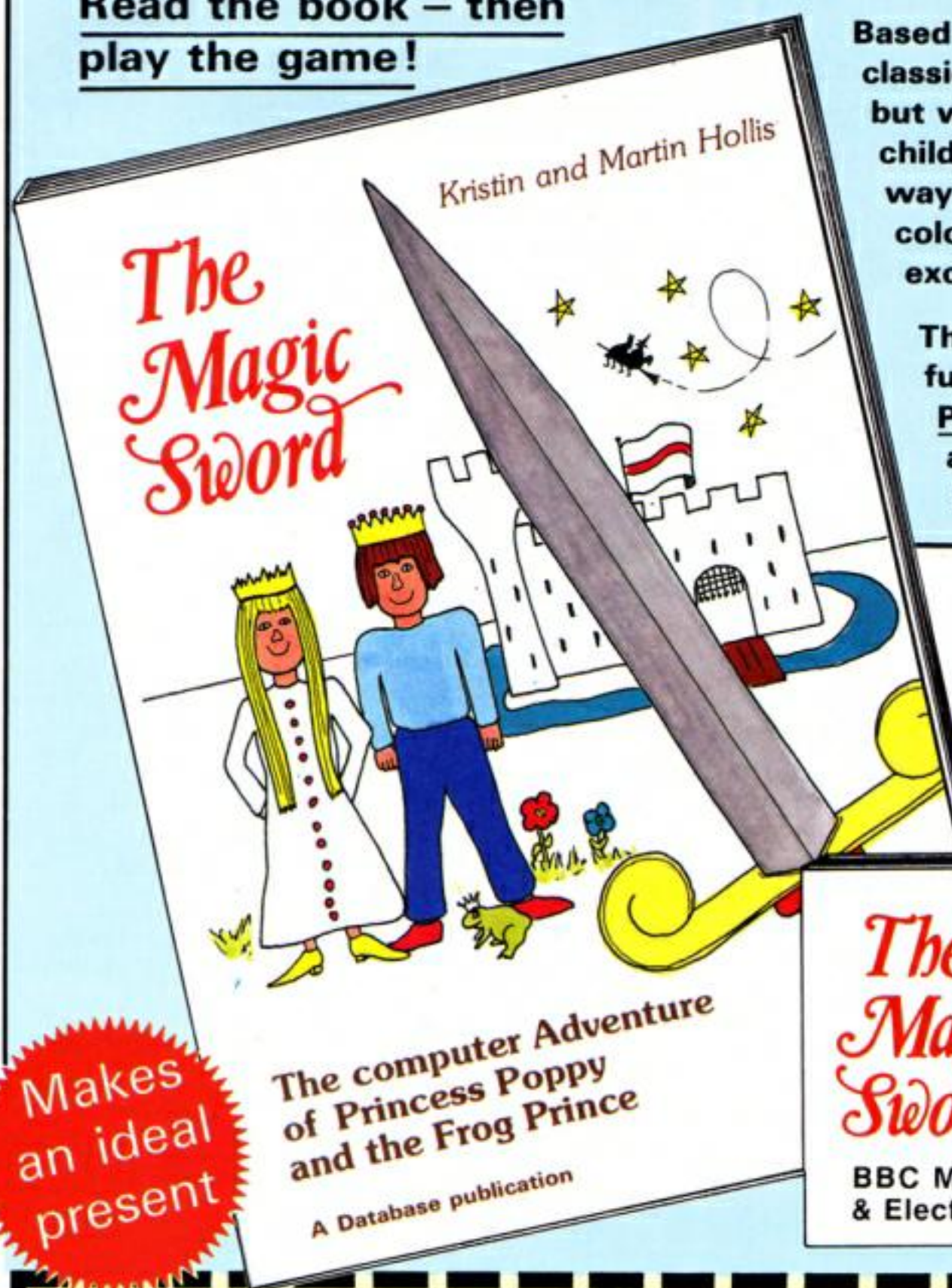


*'There must be enough number programs to keep a budding Einstein busy just counting them.'*



# You're never too young to play a Magical Adventure on the BBC Micro or Electron!

Read the book – then  
play the game!



Based on the style of the classic computer adventures – but written so that even small children can learn to find their way around, encouraged by colourful graphics and exciting sound effects.

The pack contains a 48-page full colour storybook  
**PLUS**  
a full length multi-location adventure on cassette

was **£8.95**  
**SPECIAL OFFER**  
**PRICE**  
**£5.95** inc. p&p



Please send me the complete Magic Sword pack containing storybook and cassette to:

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

- ☐ I enclose my cheque for £5.95 payable to Database Publications  
☐ Or debit my Access/Visa card:

No. \_\_\_\_\_

Signed \_\_\_\_\_

SEND TO: Adventure offer, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

EU7



## BBC/ELECTRON PROFESSIONAL SOFTWARE

Our educational software is used in thousands of schools and homes throughout Great Britain.

### EDUCATIONAL 1

BBC/ELECTRON

Tape £6.95 Disc £8.95

Hours of fun and learning for children aged five to nine years. Animated graphics will encourage children to enjoy counting, maths, spelling and telling the time. The tape includes six programs: MATH 1, MATH 2, CUBECOUNT, SHAPES, SPELL and CLOCK.

... 'An excellent mixture of games' ... Personal Software - Autumn 1983.

### EDUCATIONAL 2

BBC/ELECTRON

Tape £6.95 Disc £8.95

Although similar to Educational 1 this tape is more advanced and aimed at seven to twelve year olds. The tape includes MATH 1, MATH 2, AREA, MEMORY, CUBECOUNT and SPELL.

### FUN WITH NUMBERS

BBC/ELECTRON

Tape £6.95 Disc £8.95

These programs will teach and test basic counting, addition and subtraction skills for four to seven year olds. The tape includes COUNTING, ADDING, SUBTRACTION and an arcade type game called ROCKET MATHS which will exercise addition and subtraction. With sound and visual effects.

'These are excellent programs which teachers on the project have no hesitation in recommending to other teachers.' ... Computers in Classroom Project.

### FUN WITH WORDS

BBC/ELECTRON

Tape £6.95 Disc £8.95

Start your fun with alphabet puzzle, continue your play with VOWELS, learn the difference between THERE and THEIR, have games with SUFFIXES and reward yourself with a game of HANGMAN.

... 'Very good indeed' ... A&B Computing - Jan/Feb 1984

### JIGSAW AND

### SLIDING PUZZLES

by P. Warner

BBC/ELECTRON

Tape £6.95 Disc £8.95

There are two jigsaw and four sliding puzzles on a 3 x 3 and 4 x 4 grid. Each program starts off at an easy level to ensure initial success but gradually becomes harder. It helps children to develop spatial imagination and in solving problems. The tape includes: OBLONG, JIGSAW, HOUSE, NUMBERS, CLOWN and LETTERS.

★★SPECIAL OFFER★★

Buy three titles and deduct £4.00

Add 50p p&p per order. Please state BBC or ELECTRON or 40 or 80 track for discs.

Golem Ltd, Dept E, 77 Qualitas, Bracknell, Berks RG12 4QG. Tel: 0344 50720

## ADVERTISERS INDEX

21st Software .....	21	Mithras Software .....	58
ACP .....	2, 12	PMS .....	54
AGF .....	54	Peaksoft .....	20
Andyk .....	62	Potter Programs .....	23
C&F Associates .....	28	Qualsoft .....	40
DR Soft .....	23	Robico Software .....	20
Golem .....	62	Shards Software .....	54
Kansas City .....	63	Slogger .....	24, 25
Kosmos Software .....	62	Superior Software .....	64
LCL .....	62	Voltmace .....	10
Logic Sales .....	54		

Reach the  
top with ...

**LCL**

**Educational Software**



IMMEDIATE  
DESPATCH

WORLD LEADERS  
"AS SEEN ON TV"

VISA

ACCESS

### COMPLETE SELF-TUITION GCE COURSES

(£5 off total for 2, £10 off total for 3)

**MICRO MATHS** (Most computers).

Course taking beginners (from age 8) to

O-Level. 24 programs on 59 topics. 2

discs/tapes + 2 books **£24**

**MICRO ENGLISH** (BBC, Electron,

Amstrad). Course taking beginners to

English Language O-Level. Incorporates real

speech, no extras required. 2 discs/tapes **£24**

**MEGA MATHS** (BBC, Electron, Amstrad).

A-Level course for mature beginners.

A-Level Students or Micro Maths users.

Covers 105 topics on 2 discs/tapes + 2

books **£24**

For orders/Free catalogue phone 0784 58771 (24 hrs) or send  
to: LCL, (Dept. EU) 26 Avondale Ave, Staines, Middlesex.

## ANDYK Ltd.



### EPROM CARTRIDGE

Able to take application software.

Also one or two ROMs.

Allows use of utility ROMs. Plugs  
into Plus 1: **£9.99 + £1 P&P**

### RS423 SERIAL PORT

Has drive capability and software  
interface as the BBC Model 'B',  
plugs directly into Plus 1 cartridge  
slot. Price: **£34.99 + £1 P&P**

(as used by CBS News)



58 BARK LANE, WESHAM  
LANCASHIRE PR4 3HG.  
TEL: (0772) 682658

## KOSMOS SOFTWARE

### The ANSWER BACK QUIZ Series (BBC and Electron)

**ANSWER BACK - JUNIOR** (£9.95 cassette, £10.95 disc)

An enormous collection of general knowledge quizzes and a superb fairy-tale game for the 6-11 year olds.

**ANSWER BACK - SENIOR** (£9.95 Cassette, £10.95 disc)

A space game and a gigantic collection of general knowledge quizzes. Ages 12-Adult.

**ANSWER BACK - SPORT** (£9.95 Cassette, £10.95 disc)

Two sports games and a massive series of quizzes on all the popular sports. Ages 14-Adult.

ANSWER BACK Program Features:

- Unlimited quiz creation, editing and saving facilities. (No knowledge of programming required).
- Multiple choice, True-False? and complete-the-answer modes.
- Immediate display of mistakes; performance summary and optional re-run of questions incorrectly answered.
- Correct answers gain further turns in the compelling games.

### The FACTFILE 500 Series (BBC and Electron)

Each pack contains a supplementary database of 500 questions and 2000 multiple choice answers for use with the above ANSWER BACK programs. The modules have been compiled by teachers, experts and specialists.

<b>NATURAL HISTORY</b> (Ages 10+)	£3.95 Cassette, £5.45 disc
<b>ARITHMETIC</b> (Ages 6-11)	£3.95 Cassette, £5.45 disc
<b>SPELLING</b> (Ages 8-12)	£3.95 Cassette, £5.45 disc
<b>ENGLISH WORDS</b> (Ages 12+)	£3.95 Cassette, £5.45 disc
<b>KNOW ENGLAND</b> (Ages 12+)	£3.95 Cassette, £5.45 disc
<b>KNOW SCOTLAND</b> (Ages 12+)	£3.95 Cassette, £5.45 disc
<b>FIRST AID</b> (Ages 13+)	£3.95 Cassette, £5.45 disc
<b>GENERAL SCIENCE</b> (Ages 14+)	£3.95 Cassette, £5.45 disc
<b>SUPER SPORTS</b> (Ages 14+)	£3.95 Cassette, £5.45 disc

All prices include VAT, P&P and 24-hour despatch.

Send cheque, PO, ACCESS number or an official order.

Detailed catalogue available on request.

**KOSMOS SOFTWARE LIMITED**

**FREEPOST, DUNSTABLE, BEDS LU5 6BR. Tel: 05255 3942**





## WORD PROCESSOR #

This is the one designed for the two finger typist and has received rave notices over the past two years. It allows continuous typing, with no need to look at the screen, with line ends, margins and everything else automatically sorted out at the printing stage by the Embedded Control Characters—as used by professional word processors.

You can automatically move left margin, decrease characters per line, centre text, right justify, new line, new paragraphs, new page, underline, and enlarged, emphasised and condensed characters.

All main controls toggle on the function keys, which are: Add, Edit, Search, Replace, Save text, Load text, Inform, Exit processor, Enter processor, Delete text, Insert buffer, Clear buffer, Format.

It will do many other things, printing either continuous or single sheets, emphasised or draft copy, double or single spacing, adjustable page length and optional page numbering. Editing and insertion is simplicity itself and a buffer allows 255 characters to be moved anywhere.

Complete with extensive User Guide giving actual examples.

Catalogue price £22.50. Sale price £9.95

## DATA FILE

This one has everything! Create your own file of up to 20 fields. Decide the length of the fields and then name them. Insert the Data by just typing in. Search either the start or anywhere in any field. Edit simply by the cursor keys. Jump to any record you require. Sort by any of the fields not just the normal first one.

Print, without or with labels. Save any load files from and to cassette.

Create as many files as you want, for any purpose you want and just how you want. The choice is entirely yours!

Catalogue price £12.50. Sale price £5.95

## MICROTYPE

Now firmly established as the 'standard' typing tutor for the BBC and is now used in over 200 colleges and schools and in training by ICI, NCB, Shell, Boots, Post Office, British Telecom, etc.

The program gives both exercises and sentences with a complete analysis of your average typing speed, accuracy and the keys mis-typed. If you wish to master the computer keyboard, then this is the program for you. You will benefit even after the first lesson!

Catalogue price £12.50 Sale price £5.95

## PERSONAL ACCOUNTS

This is a tape based accounts program allowing you to keep a check on such as a bank or credit card account, or in fact any sort of personal account. It allows both credit and debit entries with a running balance. There is input space for reference and date with the use of 32 categories, any of which can be easily customised. Facilities include scrolling, edit entries, edit balance, estimate, status, load file, save file.

Catalogue price £10.50 Sale price £4.95

We operate a first class return post service, whether payment is made by cheque or credit card. Telephone orders by Access, Barclaycard or Diners before 4pm will be in our private collection at 4.30 If a program fails, no matter how caused, it will be replaced absolutely free of charge, this year, next years or in ten years...

So though the cowboys are deserting the Electron fast, Kansas will most certainly be here!

**PRICES INCLUDE VAT AND POST**

**Nothing extra to pay!**

# Kansas

Kansas City Systems, Unit 3, Sutton Springs Wood, Chesterfield, S44 5XF. Tel. 0246 850357

# New games at £4.95 each!

## LOONY LOCO

The new Arcade from Kansas—a four in one game with four entirely different and active, colourful screens. Drive the Loco, switching lines, firing harpoons and smoke to evade the rockets and planes. Then get to the buffet car by jumping the gaps and avoiding the cannon balls and arrows. If you make it, then it will be all out catching the spinning cups from the three tables. Then as you come to a standstill, in the last screen you have to find out how to release the brakes.

## MOON BUGGY

Catalogue price £8.50

An ultra active arcade game which outsold everything when on display at the last Micro User exhibition. Needs no small amount of skill to get past the first level and there are seven of them! Manipulate the Buggy three different ways as the ground speeds by and at the same time use the different firing directions to splat or jump the many obstacles. There are craters, boulders, debris, mines, tanks and bridge traps. Spacecraft and rockets all add to the excitement. This is a very challenging one, with single hazards, multiple hazards and even combination hazards. Multiple scenes with fast fluid action.

## PINBALL ARCADE

Catalogue price £10.35

The only game ever to achieve FIVE five star reviews in the Press! Now faithfully converted to the Electron, with all the original BBC features, and running at the correct speed. Build your own pinball tables from the many bumpers, targets, slings, etc., from the six pages of colourful shapes, moving or re-moving anywhere on the board. Adjust tilt, bounce and even alter the scores. A most realistic spring action and even the strength of the flippers are adjustable. After a board as been created, it can be saved to tape, played and even altered again.

## THE FERRYMAN AWAITS

Catalogue price £9.50

There's never been anything like it before! An entirely new computer language—TOC—has resulted in cramming a virtual 60K Adventure into the normal Electron! Devised by the programmer, this has resulted in the most involved and devious Adventure ever to appear on the Electron, with literally around half a screen of text depicting each location and objects. Hundreds of real locations and countless objects and things take the adventurer onto a totally different plane. It is the only Adventure to accept more than a two word command. Such as TAKE SKULL FROM SHELF OPEN DOOR is quite acceptable! It will even accept multiple commands. Set in the future, it is a magical quest in a wasteland populated only by fanatical devil worshippers and savage pirate hords, to which you are sold as sacrifice. Do not expect to complete this Adventure in a few evenings, it will take a long, long time. And you will need our Help! service...

# Any THREE below for £8.50!

SINGLE COPIES £3.95

## FIGHTER PILOT

Catalogue price £8.50

A true cockpit view of both the runway during take-offs and landings, and the enemy fighters which have to be blasted out of the sky. Graphics include an accurate radar system and a combined artificial horizon and turn and bank indicator. Information shown on fuel, speed, rate of climb, altitude and score. As the fuel gets low, you can switch to approach, land, re-fuel and take off again.

## CAVEMAN

Catalogue price £9.50

Take the barrow down the lift into the many galleries of the mine, first to dig for diamonds and then for gold. Astute use of the lift and ladders and you might escape the monsters—or lead them to their destruction. Then go down for coal to re-fuel the furnace, which depletes as you use energy for the lift.

## MANIAC MOWER

Catalogue price £8.50

Try to mow the grass in the park whilst avoiding the maniac mower, whose only aim is to cut you up! To make it harder there are lots of nasties lurking in the grass—all out to get you. To make it harder still there is a karate expert training in the park, who is very unfriendly indeed!

## HARLEQUIN

Catalogue price £9.95

Played by one, two or four players. Harlequin is a very different sort of game—treasure hunting on the computer! Try to find which of the 14 treasure places the treasure is hidden, using the given clues. In addition to the information, there are lots of different tunes, very well done, with plenty of colour.

## MUNCHMAN

Catalogue price £8.50

This is the one that started it all—a real live 'Pacman' for the Electron. It is just like the original Arcade game with ghosties chasing you around as you devour, with all the facilities of the energisers which give limited time to zap the ghosties.

## SNAKE

Catalogue price £7.50

Seven hectic levels with split screen and even double split screen make this very active indeed. The snake gets longer as the mushrooms are devoured, but avoid the toadstools at all costs. Ideal for young children, whilst by increasing the speed, active for adults and experts too.

## REVERSI

Catalogue price £7.50

The Electron as your partner at Reversi—also known as Othello. Plays to all the rules with accepted black and white counters on a green board. Moves easily entered with very quick responses. All information and scores on the screen.

## DRACULA ISLAND

Catalogue price £9.50

This Adventure has started countless people on adventures and provided a great deal of pleasure. The aim is to find and kill Count Dracula before he gets you. It is an ideal starter, needing plenty of effort to solve but not being too difficult to finish. Like all Kansas adventures, it is totally logical, which means things are always in the same place or where you leave them. Also like every Kansas adventure it has a game saving facility. And if you really get stuck, don't throw it away in disgust—give us a ring, for we operate a telephone Help? service!

## RING OF TIME

Catalogue price £9.50

The sequel to Dracula, this is a little harder to solve, though still retaining all the features, including the split screen, which means the important information remains on the screen all the time. The object is to retrieve the elusive Ring of Time, going through many trials and tribulations.

## REVENGE OF ZOR

Catalogue price £9.50

The long awaited sequel to Dracula and Ring of Time. Somewhat more difficult in this Adventure you have to escape the vortex and the revenge of the evil Zor. This is a natural progression, and the adventurer will find the programmer has become much more devious, thus requiring greater effort to solve.



# AN EXCITING KARATE CHAMPIONSHIP GAME

£8.95

# KARATE

# COMBAT



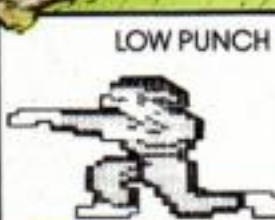
THE INTRODUCTORY RITUAL



IN MID BATTLE



LOW KICK



LOW PUNCH



HIGH PUNCH



ARM BLOCK



SWEEP



HIGH KICK



FLYING KICK

KEYBOARD

JOYSTICKS

**ELECTRON**

**BBC  
MICRO**

Set in the realm of the mystic Orient, Karate Combat pairs you, in thrillingly realistic battle, against 16 of the mightiest and most skilful exponents of "open-hand" fighting. Each opponent has different fighting characteristics and you must cunningly use different techniques to tackle each adversary. Your aim is to move up the rankings and eventually do battle against the 16th opponent, the ultimate challenge — The Master! In addition to the competition mode, the program includes a 2-player mode and a practice mode, complete with a punch-bag, to enable you to master your repertoire of punches, kicks, blocks, spins, sweeps and the spectacular flying kicks.

**PRICE: £8.95 (cassette), £11.95 (BBC disc)**

**COMPETITION COMPETITION COMPETITION COMPETITION**

**COMPETITION** — If you defeat The Master you can enter our competition with a chance of winning an impressive trophy (pictured on the right) and the cash prize of **£100**. Closing Date: 30th September, 1986.



**SUPERIOR  
SOFTWARE**

Limited

Dept. EU4, Regent House,  
Skinner Lane, Leeds 7.  
Tel: 0532 459453.



**OUR GUARANTEE**

- All mail orders are despatched within 24 hours by first-class post.
- Postage and packing is free.
- Faulty cassettes and discs will be replaced immediately.



**WE PAY TOP ROYALTIES FOR HIGH QUALITY SOFTWARE**